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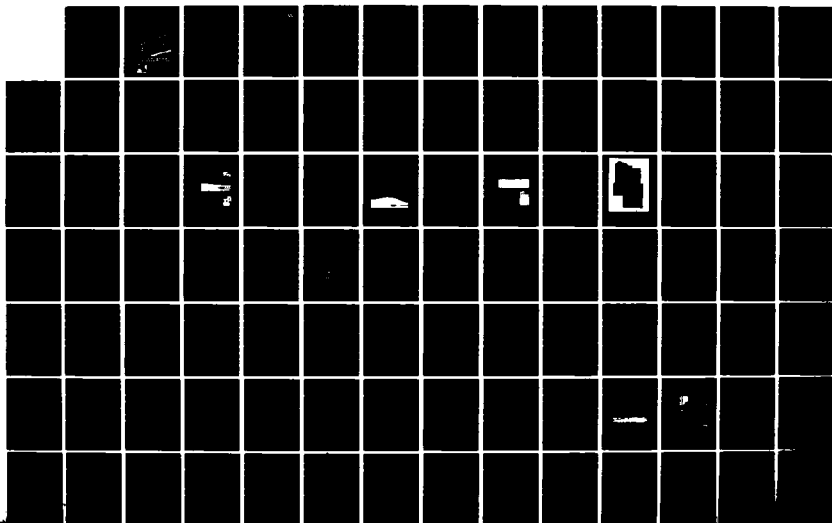
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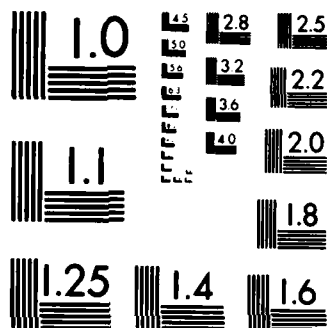
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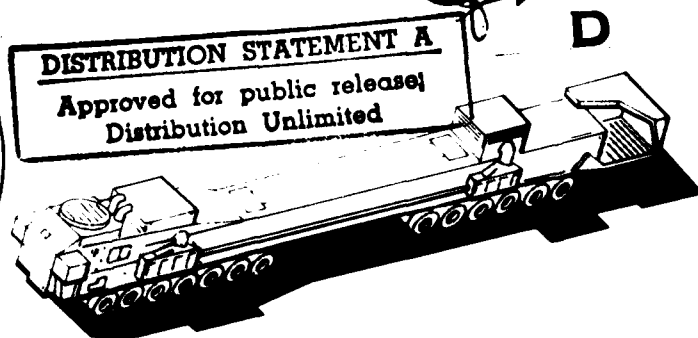
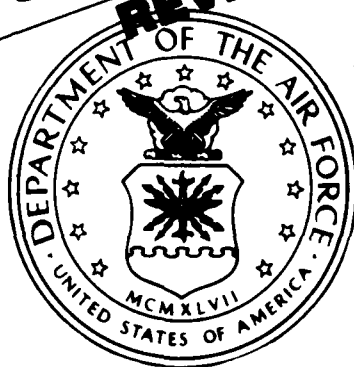


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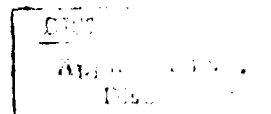
Prepared for
United States Air Force
Ballistic Missile Office
Norton Air Force Base, California

By
Henningson, Durham & Richardson, Inc.
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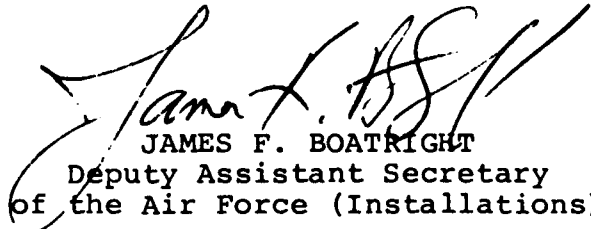
Federal, State and Local Agencies

On October 2, 1981, the President announced his decision to complete production of the M-X missile, but cancelled the M-X Multiple Protective Shelter (MPS) basing system. The Air Force was, at the time of these decisions, working to prepare a Final Environmental Impact Statement (FEIS) for the MPS site selection process. These efforts have been terminated and the Air Force no longer intends to file a FEIS for the MPS system. However, the attached preliminary FEIS captures the environmental data and analysis in the document that was nearing completion when the President decided to deploy the system in a different manner.

The preliminary FEIS and associated technical reports represent an intensive effort at resource planning and development that may be of significant value to state and local agencies involved in future planning efforts in the study area. Therefore, in response to requests for environmental technical data from the Congress, federal agencies and the states involved, we have published limited copies of the document for their use. Other interested parties may obtain copies by contacting:

National Technical Information Service
United States Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
Telephone: (703) 487-4650

Sincerely,


JAMES F. BOATRIGHT
Deputy Assistant Secretary
of the Air Force (Installations)

1 Attachment
Preliminary FEIS

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Operating Base Vicinity Environment



OPERATING BASE VICINITY ENVIRONMENT

The Proposed Action and eight alternatives present deployment systems featuring full deployment of 200 missiles in Nevada/Utah or Texas/New Mexico, and split basing deployment of approximately one-half the missile in Nevada/Utah and one-half in Texas/New Mexico. The Proposed Action and alternatives each require two operating base (OB) complexes. Base site locations under study are in the vicinity of Ely and Coyote Spring Valley, Nevada; Beryl, Milford, and Delta, Utah; Clovis, New Mexico; and Dalhart, Texas.

Both OB complexes will contain a provision for an airfield. In addition, they may contain any or all of the following: designated assembly area (DAA), operating base test sites (OBTS), railroad spur and connection to the designated transportation network. Each of these major components is described in Chapter 1.

- o The OB, with airfield, contains the support facilities found at most major Air Force bases, plus specialized technical support facilities.
- o The DAA is where missiles, canisters, and launchers are assembled and checked out.
- o The OBTS, located at the first OB/DAA constructed, is a group of three shelters plus test and support facilities; it will be used for system development and evaluation.

If the full deployment basing mode is selected, only one DAA will be required. If the alternative choice is split basing, two DAAs will be provided, one at each OB. If the second DAA is required, a supporting railroad spur and connection to the DTN will also be required. An OB complex that has a DAA will have more personnel than one without a DAA and will require a larger land area.

Table 3.4-1 shows the Proposed Action, all of the alternatives, and the major location of the OB complexes. Table 3.4-2 summarizes the OB complex major components for first and second operating bases, and for full deployment and split basing. Table 3.4-3 shows approximate land area requirements for operating base complexes.

Table 3.4-1. Proposed Action and Alternatives.

Proposed Action Alternatives	Deployment Areas ¹		Operating Base Vicinities	
	Nevada/Utah	Texas/New Mexico	First	Second
Proposed Action				
Nevada/Utah, Full Deployment	200	0	Coyote Spring Valley, Nev.	Milford, Utah
Full Deployment Alternatives				
1. Nevada/Utah	200	0	Coyote Spring Valley, Nev.	Beryl, Utah
2. Nevada/Utah	200	0	Coyote Spring Valley, Nev.	Delta, Utah
3. Nevada/Utah	200	0	Beryl, Utah	Ely, Nev.
4. Nevada/Utah	200	0	Beryl, Utah	Coyote Spring Valley, Nev.
5. Nevada/Utah	200	0	Milford, Utah	Ely, Nev.
6. Nevada/Utah	200	0	Milford, Utah	Coyote Spring Valley, Nev.
7. Texas/New Mexico	0	200	Clovis, N. Mex.	Dalhart, Tex.
Split Deployment Alternative				
8. Nevada/Utah- Texas/New Mexico	100	100	Coyote Spring Valley, Nev.	Clovis, N. Mex.
No Action Alternative	NA	NA	NA	NA

T3623/9-16-81/F

¹The numbers represent missiles deployed (approximate for split basing).

Source: Department of the Air Force, Headquarters Ballistic Missile Office (AFSC), 1981.

Table 3.4-2. Major components for operating base complexes.

Full Deployment Basing Mode		Split Basing Mode	
First OB Complex	Second OB Complex	First OB Complex	Second OB Complex
Operating Base ¹	Operating Base ¹	Operating Base ²	Operating Base ²
DAA		DAA	DAA
DTN		DTN	DTN
OBTS		OBTS	

T3017/10-2-81/a

¹ The OB at the first OB complex is larger than the OB at the second OB complex.

² In the split basing mode, the second OB and airfield are approximately the same size as the first OB and airfield.



The M-X operating base will have many features similar to Cannon AFB near Clovis or Nellis AFB, pictured above, near North Las Vegas. The M-X base will be a SAC base with fewer air operations than either Cannon or Nellis.

Table 3.4-3. System land area requirements for operating base complexes.

STRUCTURE	CONSTRUCTION PHASE (ACRES)	OPERATIONS PHASE (ACRES)		
		FENCED	NON-FENCED	TOTAL
Full Deployment Basing Mode				
First Operating Base W/Airfield ¹	6,140	3,740	2,400	6,140
Second Operating Base W/Airfield	4,240	2,740	1,500	4,240
Designated Assembly Area (DAA)	1,950	1,950	—	1,950
Operational Base Test Site (OBTS) ²	250	30	60*	90
Split Basing Mode				
First Operating Base W/Airfield ¹	6,140	3,740	2,400	6,140
Second Operating Base ³ W/Airfield ¹	6,140	3,740	2,400	6,140
Designated Assembly Area (DAA) ³	1,950	1,950	—	1,950
Operational Base Test Site (OBTS) ²	250	30	60*	90

3018-1

¹Airfield includes clear zones.

²An additional 160 acres of land is required on a temporary basis during construction.

³For split basing mode, second operating base will be same as first operating base and will also have a DAA. It will not have an OBTS.

*This land requirement is primarily roads to connect the several widely separated major components of the OBTS.



BERYL



BERYL

The area of analysis (AOA) for the Beryl operating base includes Iron County. The AOA is located in the south central section of the designated region of influence (ROI) as shown in Figure 3.4.1-1. Cedar City is the major settlement in the AOA. This section and Chapter 4 detail important environmental characteristics of Beryl and vicinity and the proposed base site, respectively.

In 1849, Brigham Young sent an expedition to explore and locate suitable sites for settlement. They discovered an iron ore deposit west of what is now Cedar City, hence the name Iron County. In 1851, Cedar City and Parowan were established. To this day they remain the major population center in Iron County.

The principal industries of Iron County are mining and shipping iron ore. The first iron ore refined west of the Mississippi occurred here. However, early smelting efforts failed because of the lack of economical transportation to large markets.

In 1923, when Union Pacific Railroad ran a spur line into Cedar City, agriculture and iron ore, mining and processing moved forward as major industries.

Quality of Life, Iron County, Utah (3.4.1.1)

Iron County's population was 15,000 persons in 1977, with the majority located within Cedar City. In 1970, 73.5 percent of the residents in Iron County lived in Cedar City. Thus, the population density of Iron County is sparse outside this community. Its density was 4.4 per sq mi county wide in 1977, reflecting a lower density level than most areas in Utah. Between 1970-1977, the average annual growth rate was 2.9 percent, which is higher than the Utah mean of 2.5 percent. The major portion of this increase occurred in Cedar City, while the population in the remainder of Iron County actually decreased. The median age in Iron County is somewhat lower than the state median age because of student enrollment at Southern Utah State College in Cedar City.

The median housing value in Iron County was \$16,487 in 1970, compared to \$17,057 for the Utah state mean. In general, the housing situation seems relatively

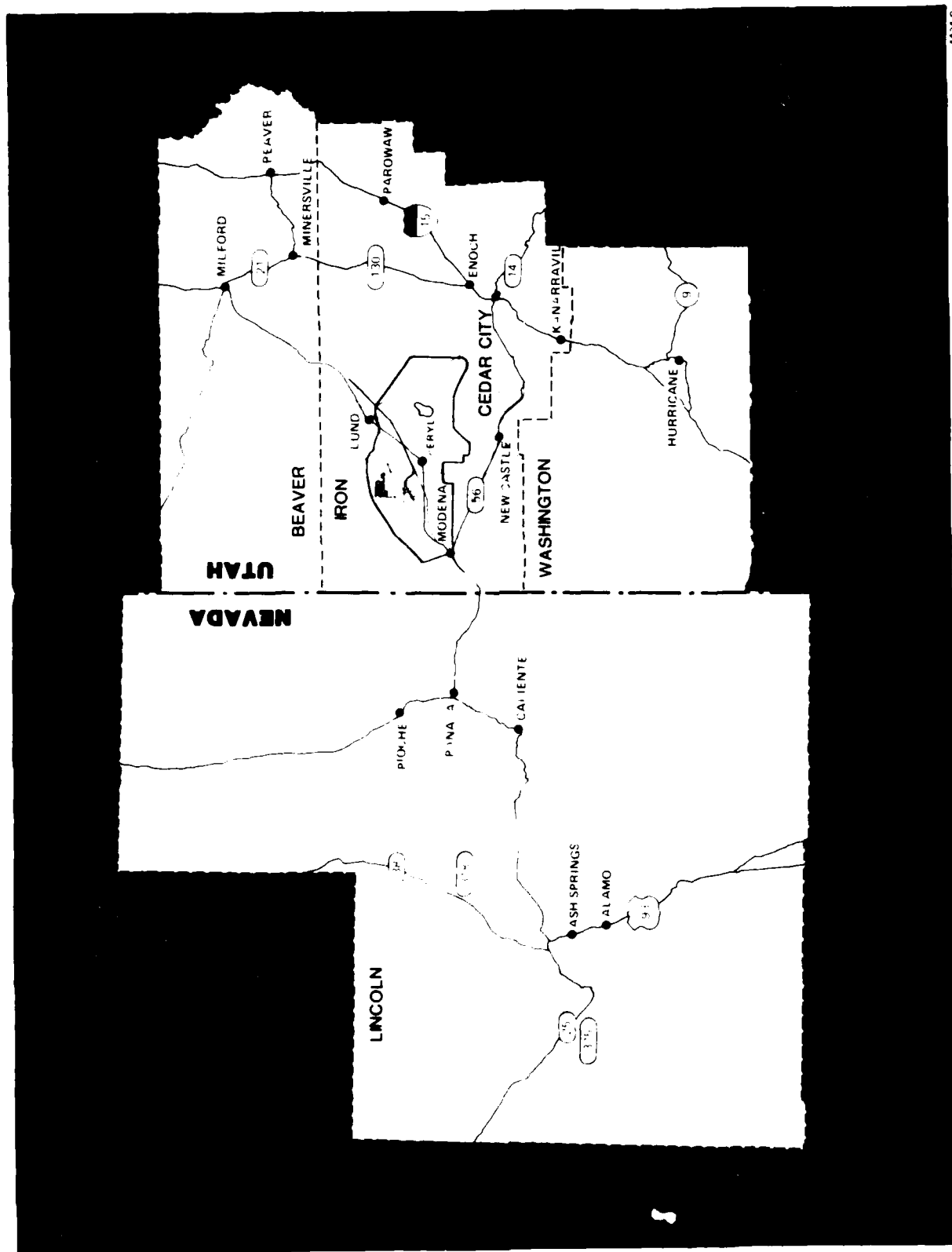


Figure 3.4.1-1. Area of analysis (AOA), Beryl.

good, with many houses for sale and the ability to handle more expansion in housing demand (Alunite Final Environmental Statement). There was 70.5 percent owner-occupancy of the housing market with a high level of mobile homes at 8.4 percent, and a higher than average number of rental units. The Utah state mean level of mobile homes was only 2.7 percent (Table 3.4.1.1-1).

Iron County's economy is dominated by trade, state and local government, and services as it is an important recreational center. The fastest growing sectors are finance, insurance, and real estate, which have grown 23 percent annually since 1969. The civilian labor force growth rate (1970-1977) was 5.8 percent higher than other study areas and somewhat similar to the Utah mean of 5.6 percent. The unemployment rate of 6.2 is slightly above the Utah mean of 5.3 percent during 1977. Only 13.3 percent of the population was receiving public assistance in 1976, as compared to a Utah mean of 14.9 percent. During 1977 the per capita income of Iron County was \$4,693, approximately 78 percent of the Utah mean level of \$5,923 (Table 3.4.1.1-1).

In general, people in Iron County tend to be quite satisfied with their communities, mentioning such advantages as access to out-of-doors; good place to raise family; friendliness of people; and an unpolluted environment. Disadvantages included the lack of jobs for young people, lack of good shopping centers, lack of cultural refinement, and lack of opportunities for earning a livable income.

In 1976, citizen committees were organized to prioritize community problems. Ranked as the number one problem area was unemployment/underemployment, followed by inadequate income, family conflicts, crime/delinquency, child abuse and neglect, and drug/alcohol abuse (Five County Association of Governments, 1978:54).

A review of Iron County's public services and related social characteristics describes a somewhat variable situation. Health services on the whole are low to adequate, with 0.7 physicians/1,000 population; 1.0 dentists/1000; 3.8 registered nurses/1,000 population; and 3.6 hospital beds/1,000 population. These levels compare to the Utah state mean levels of 1.4, 0.7, 4.8, and 4.1, respectively (Table 3.4.1.1-1).

Public safety indicators show only 1.8 law enforcement personnel per 1,000 in Iron County, compared to ratio of 2.3 for the state. This level is similar, though, to other study area counties. Social stress indicators, which include divorce, suicide and alcoholism rates, show Iron County to be relatively stable. The divorce rate was 3.5/1,000 population and the suicide was 3/100,000 population during 1976. This compares to Utah state means of 5.1 and 13.0, respectively for these statistics. The numbers of reported violent crimes and crimes against property were about average with other Utah study counties (Table 3.4.1.1-1).

Natural Environment (3.4.1.2)

The following sections describe existing characteristics of the natural environments of the Beryl Operating Base Vicinity. Topics covered include Water Resources, Erosion, Air Quality, and Biological Resources.

Table 34.1.1-1. Selected measures of the quality of life, Utah (Page 1 of 3).

Indicator	United States	Utah	Beaver County (Milford)	Iron County (Beryl)	Millard County (Delta)
Population					
Annual Rate of Growth (1970-1977)	0.9	2.5	1.6	2.9	2.5
Population Density (1977)	61.1	15.5	1.7	4.4	1.2
Housing					
Percent of Dwelling Units Owner Occupied (1970)	62.9	69.3	82.5	70.5	85.5
Percent of Housing Units with More than 1.01 Persons/Room (1970)	8.0	10.0	8.1	9.5	10.3
Mobile Homes or Trailer as Percent of Housing Units (1970)	4.5	2.7	4.1	8.4	2.8
Median Home Value (1970)	17,130	17,057	12,081	16,487	10,519
Economics					
Civilian Labor Force Growth Rate (1970-1977)	2.4	5.6	4.1	5.8	3.3
Unemployment Rate (1977)	7.0	5.3	7.0	6.2	4.7
Per Capita Income (1977)	7,026	5,923	5,114	4,693	3,978
Proportion of Population on Public Assistance (1976)	22.2	14.9	18.1	13.3	20.7

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Table 3.4.1.1-1. Selected measures of the quality of life, Utah (Page 2 of 3).

Indicator	United States	Utah	Beaver County (Milford)	Iron County (Beryl)	Willard County (Dona)
Health					
Physicians/1,000 Population (1976)	1.7	1.4	1.0	0.7	0.5
Dentists/1,000 Population (1976)	0.5	0.7	0.9	1.0	0.3
Registered Nurses/1,000 Population (1976)	4.5	4.8	5.3	3.8	2.5
Hospital Beds/1,000 Population (1975)	6.6	4.1	5.6	3.6	4.5
Public Safety					
Police Officers/1,000 Population (1976)	2.8	2.3	1.0	1.8	1.1
Firefighters/1,000 Population (1968)	2.0	N/A	N/A	N/A	N/A
Violent Crimes/1,000 Population (1976)	4.0	2.4	1.5	1.5	1.5
Crimes Against Property/1,000 Population (1976)	45.9	45.1	21.1	21.1	21.1
Social Stress					
Divorce Rates/1,000 Population (1975)	4.9	5.1	3.7	3.5	1.7
Suicide Rate/100,000 Population (1976)	12.2	13.0	9.4	3.0	9.4
Alcoholism Rate/1,000 Population (1976)	42.0	20.7	22.8	22.8	19.3

Table 3.4.1.1-1. Selected measures of the quality of life, Utah (Page 3 of 3).

Indicator	United States		Utah	Beaver County (Milford)	Iron County (Beryl)	Millard County (Delta)
Education						
Median School Years Completed (1976)	12.5		12.8	12.3	12.8	12.4
Pupil/Teacher Ratio	19.5:1		24.8:1	21.2	24.8	23.4

T4844/9-16-81/F

Sources: Architects and Planners Alliance, Inc., 1979; Bureau of Economic and Business Research, 1979; De Chiasa, J. and L. Koppelman, 1975; Four Corners Regional Commission, 1979; Golden, J. et al., 1979; Nevada Department of Education, 1979; Nevada Office of Health Planning and Resources, 1977; Nevada Office of Planning Coordination, 1978; U.S. Department of Commerce, 1978 and 1979; U.S. Department of Commerce, Bureau of the Census, 1973 and 1978; U.S. Department of Justice, 1977.

Water Resources (3.4.1.2.1)

General Hydrology

The Beryl, Utah area lies within the Escalante Desert portion of the Cedar Hydrologic Unit (Utah State University, 1963). Sandberg (1966) reported that valleyfill deposits constitute the only known aquifer within the area and consist of interbedded gravel, sand, silt, and clay. Records compiled by the U.S. Geological Survey (1979) indicate that the depth to groundwater is less than 50 ft west of Beryl, but exceeds 200 ft along the valley margins at higher topographic elevations. The direction of groundwater movement is from the valley margins toward the center of the valley and north-west toward Lund (Sandberg, 1966). Utah Division of Water Resources (1979) reported water-level declines of less than 20 ft for the Beryl Enterprise area during the period 1967 to 1978. Nearly all recharge to groundwater comes directly or indirectly from precipitation in the mountains. A small amount of underflow from Cedar City Valley moves through alluvial deposits in mountain range gaps (Sandberg, 1966).

Three perennial streams in the basin supply surface water to the Beryl District: Shoal, Pinto, and Meadow creeks. These creeks drain the Harmony and Bull Valley mountains and associated ranges and supply water to three small areas near the mouth of each creek in the vicinity of Enterprise and Newcastle. There are no gauging stations; however, it is estimated that their combined normal base or low flows range from five to ten cubic feet per second (cfs) (White, 1932). In addition to this amount, there are flood discharges following heavy rains and periods of rapid snowmelt.

Water Availability

Surface water has been fully appropriated. Perennial yields of 30,000 acre-ft have been estimated for the groundwater system in the Escalante Desert area (Price, 1979). According to the Utah Division of Water Resources, groundwater use in the Beryl-Enterprise area averaged 79,000 acre-ft per year for the ten-year period from 1968-1977 (Price et al., 1979). Groundwater withdrawals for some years were as high as 93,000 acre-ft; however, withdrawals for 1978 totaled only 70,650 acre-ft. Of that amount, about 69,600 acre-ft were used for irrigation, 750 for domestic and stock use, and 300 for municipal purposes. There is significant overdraft of groundwater resources in portions of the Escalante area. Given the current legal constraints on water development, it is likely that the only local source of available water for M-X is through purchase of existing rights. Such transfers of water rights would require approval of the State Engineer.

Erosion (3.4.1.2.2)

The soils of the proposed Beryl OB site have slopes ranging from 0 to 7 percent. The Dixie-Neola association predominates in the site area. Dixie soils in surface textures range from gravelly on upper slopes to fine on the lower portions. Water and wind erodibility of these soils is moderate to high.

Air Quality (3.4.1.2.3)

A summary of some climatological parameters governing air quality appear in Table 3.4.1.2-1.

Particulate emissions for Iron County are 3,800 tons/year from all sources except windblown fugitive dust. The baseline levels in Iron County for CO, SO_x, NO_x, and hydrocarbons are listed in Table 3.4.1.2-2. The region surrounding Beryl and the community of Beryl are designated a Class II attainment area for all pollutants.

Beryl receives an average of 11.03 in. of precipitation per year. This precipitation is evenly distributed throughout the year and is not considered an important factor in controlling natural dust emissions.

No air quality monitoring data exist for this area.

Biological Resources (3.4.1.2.4)

Vegetation and Soils

The vegetation near the Beryl OB site is characteristic of the Escalante Desert at lower elevations, and typical of montane areas in this region at higher elevations. Figure 3.4.1.2-1 shows major vegetation types occupying areas large enough to be mapped at the given scale. Salt marsh, alkali sink scrub, shadscale scrub, Great Basin sagebrush, and pinyon-juniper woodland occur.

Three salt marshes are located in the southern part of the site. These relatively small areas are characterized by salt flats and boggy areas dominated by pickleweed (Salicornia spp.) and saltgrass (Distichlis spicata).

Alkali sink scrub borders the salt marshes and is the dominant vegetation type in the valley bottom. Stands of pure black greasewood (Sarcobatus vermiculatus) are characteristic of the flat, level, heavy soils immediately above the salt marshes. On the borders of the valley floor, black greasewood is mixed with shadscale (Atriplex confertifolia) and rabbitbrush (Chrysothamnus spp.).

An extensive vegetation type of bajadas is shadscale scrub, which typically consists of a mixture of shadscale, greasewood, rabbitbrush, and winterfat (Eurotia lanata). Pure stands of winterfat occur on the lower bajadas.

Great Basin sagebrush occurs immediately above shadscale scrub and extends further up the bajadas. The understory of this community has been seriously reduced in some areas by excessive grazing. Dominant species include big sagebrush (Artemisia tridentata), antelope brush (Purshia tridentata), and various bunchgrass species.

In addition, the valley bottom supports a mosaic pattern of cropland and disturbance-associated vegetation, including sites dominated by Russian-thistle (Salsola iberica).

Above the sagebrush vegetation, at the highest elevations of the proposed OB site, and above 6,000 ft in the general area, pinyon-juniper woodland occurs. This

Table 3.4.1.2-1. Climatological data for the potential operating base sites.

Community/ Potential OB Location	Mean Annual Precipitation (in.)	Mean Annual Visibility	Percent Visible Dust Frequency ¹	Average Annual Mixing Height (meters)		Average Annual Wind Speed ³ (m/sec)	
				Morning ²	Afternoon ²	Morning ²	Afternoon ²
Beryl, Utah	11.03	70 mi	0.50	300	2,600	4.0	6.0
Coyote Spring, Nevada	4.55	70 mi	0.200	300	2,500	4.0	6.0
Delta, Utah	7.16	70 mi	0.250	300	2,500	4.0	6.0
Ely, Nevada	8.33	70 mi	0.054	300	2,400	4.0	6.0
Milford, Utah	8.00	70 mi	0.200	300	2,600	4.0	6.0
Clovis, New Mexico	17.47	45-70 mi	2.100	400	2,300	6.2	7.5
Dalhart, Texas	16.33	45-70 mi	1.200	350	2,100	6.5	8.0
T2101/7-15-81							

¹Percent of hourly observations per year with visible dust; values at Coyote Spring, Beryl, Delta, and Dalhart have been estimated from nearby weather stations.

²Estimated from values at nearby weather stations.

³Wind speed is averaged through the mixing layer.

Table 3.4.1.2-2. Total emissions and emission density levels at potential OR locations.

Emissions/ Emission Density Levels	Potential Operating Base Location						
	Beryl, Utah ^C	Coyote Spring, Nevada ^a	Delta, Utah ^C	Ely, Nevada ^a	Milford, Utah ^C	Clovis, New Mexico ^e	Dalhart, Texas ^d
Total Particulate Emissions Tons/yr	3,800	115,587	4,541	72,666	2,088	1,510	51,923
Particulate Density Tons/yr/mi ²	1	175.9	1	37.4	1	1-10	0.1-10
Total SO _x Emissions Tons/yr	974	33,363-274,426	294	274,426	158	564	74,928
SO _x Density Tons/yr/mi ²	1	0.1-10	1	30-100	1	1	0.1-10
Total NO _x Emissions Tons/yr	1,836	12,641-96,378	1,588	12,641	943	2,997	140,323
NO _x Density Tons/yr/mi ²	3	0.1-30	3	3	3	3	0.1-30
Total Hydrocarbons Emissions Tons/yr	2,223	15,673-23,071	2,114	15,673	1,186	3894	152,036
Hydrocarbon Density Tons/yr/mi ²	3	0.1-10	3	3	3	3	0.3-30
Total CO Emissions Tons/yr	11,769	79,896-131,010	11,049	79,896	6,139	16,332	1,100,143
CO Density Tons/yr/mi ²	10	0.1-30	10	10	10	10-30	0.1-300

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^aParticulate data are latest data available from state of Nevada (year unspecified). Particulate data are reported on hydrographic sub-basin basis. Particulate data include windblown fugitive dust sources. Gaseous emission data are from NEIS (1975) and EPA Emissions Trends Report (1977).

^bCoyote Spring sub-basin is part of both AQCR no. 13 and no. 147. Gaseous emission levels are given as range using data from both AQCRs.

^cParticulate and gaseous emission levels reported by county from state of Utah (1976 data). Particulate data do not include contribution from windblown fugitive dust sources. Density values from EPA Emissions Trends Report (1977).

^dParticulate and gaseous emission levels reported for AQCR no. 211 from NEIS (1975). Density values from EPA Emissions Trends Report (1977).

^eParticulate and gaseous emission levels reported by county from state of New Mexico. Particulate data do not include contribution from windblown fugitive dust sources. Density values from EPA Emissions Trends Report (1977).

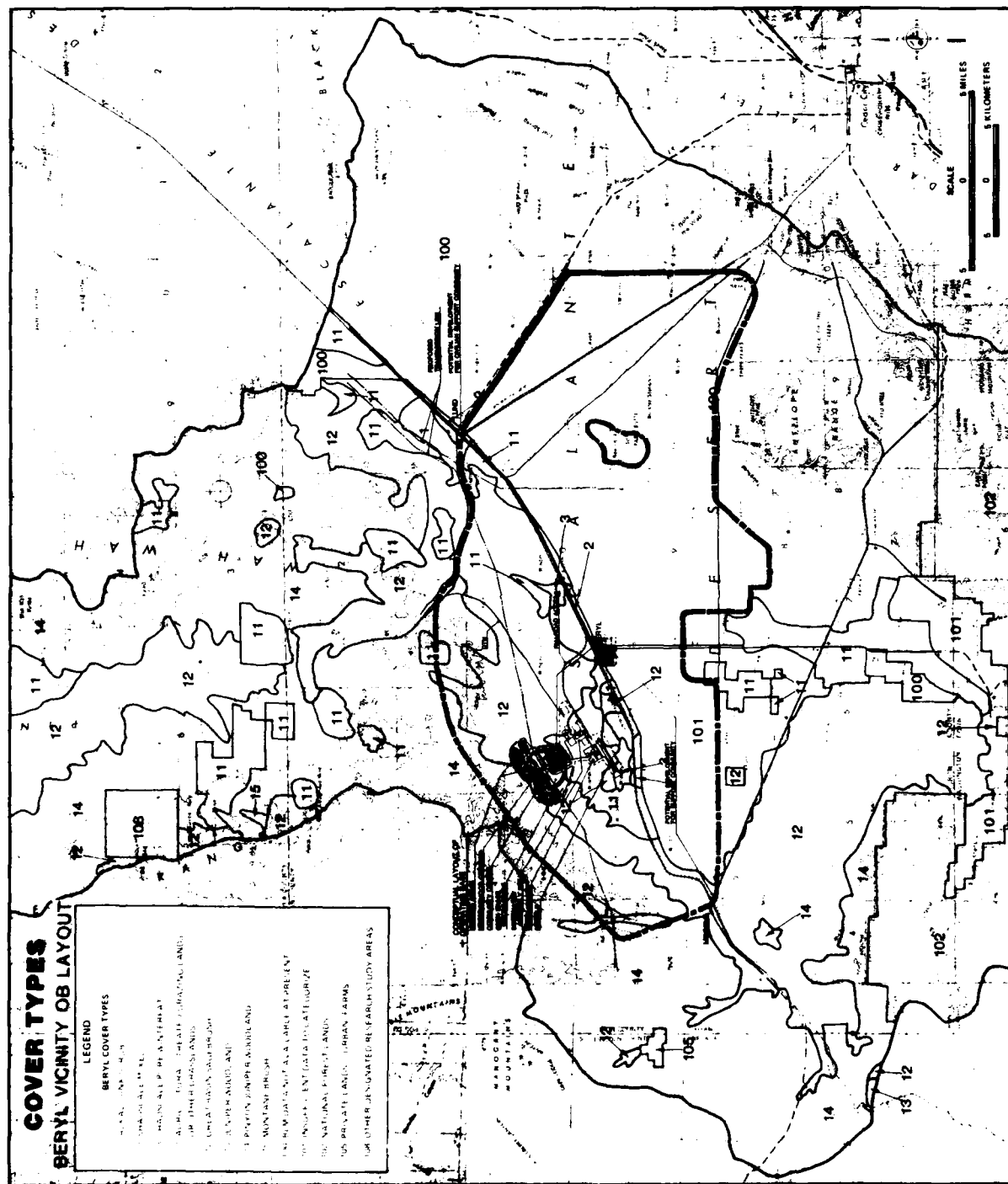


Figure 3.4.1.2-1. Vegetation cover types in the vicinity of Beryl.

vegetation is composed of Utah juniper (*Juniperus osteosperma*), single-leaf pinyon (*Pinus monophylla*), and an understory of hopsage (*Grayia spinosa*), big sagebrush, rubber rabbitbrush (*Chrysothamnus nauseosus*), and Mormon tea (*Ephedra* spp). Shifts in dominance occur locally in response to topographic and geographic variances. In general, junipers dominate the lowest elevations of this type, with mixed juniper, pinyon woodlands, and pure pinyon woodlands dominating the upper elevations.

Above pinyon-juniper woodland on north slopes in montane brush, vegetation is dominated by Rocky Mountain oak (*Quercus gambelii*), black sagebrush, serviceberry, and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). A small stand of ponderosa pine (*Pinus ponderosa*) occurs on rocky slopes south of Enterprise Reservoir, in the southwest corner of the Dixie National Forest.

The soils belong predominantly to the Dixie-Neola series association, formed on very gently to moderately sloping older alluvial fans and gravelly loam and sandy loam surface textures. They are underlain by a layer of cemented calcium carbonate at 12 to 36 in. Minor soils in the area are deep, with clay loam surface textures. Generally, the water holding capacity and the level of organic matter and nutrients are low.

Wildlife

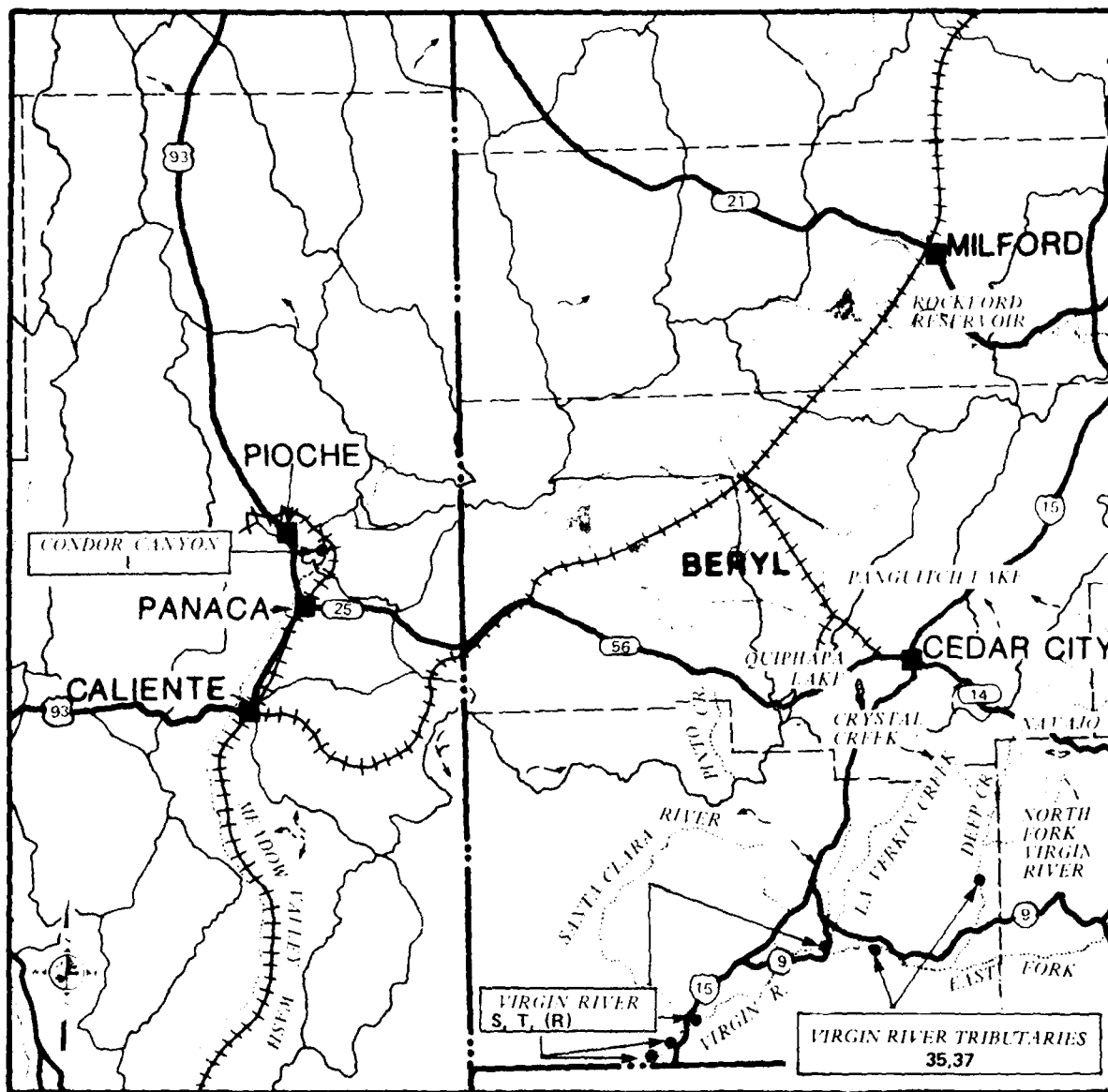
The site is in the southernmost part of the Escalante Desert herd of pronghorn in Utah. The range extends north up the Escalante Desert and into the Wah Wah Valley. Key habitat is present in the northern and eastern portions of the suitability zone. Mule deer occur in low numbers in the Wah Wah Mountains and the Needle Range north of the OB site. The summer range of a transplanted population of elk is about 5 mi north in the Needle Range.

Aquatic Species

No permanent aquatic habitats occur near enough to the proposed Beryl OB to be directly impacted (see Section 3.4.1.2.2). The nearest fishing areas include Newcastle Reservoir, Upper and Lower Enterprise Reservoirs, Baker Reservoir, and the Santa Clara River and its adjacent reservoirs. Other fishing opportunities are located in the mountains to the south and east. Minersville Reservoir, Beaver River, the north fork of the Virgin River, and the Pinto Creek drainage will supply game fishing opportunities.

Protected Species

No protected or recommended protected aquatic species occur near Beryl (Figure 3.4.1.2-2). The nearest locations are 30 mi to the west for the recommended protected Big Spring spinedace, and up to 50 mi South-Southeast for the federally protected woundfin, state protected roundtail chub, and recommended protected virgin spinedace. The base is located approximately 10 mi south of the major transplant site of the Utah prairie dog, a federally listed endangered species, in Pine Valley, Utah. The DTN passes directly through this transplant area. No rare plant species or protected fish species are known from the immediate area, however, the region of influence identified for study and analysis for subsequent tiered decisionmaking is known to include the following federal candidate rare plant



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Figure 3.4.1.2-2. Locations of protected and recommended protected aquatic biota near Beryl and Milford.

species: the timber poisonvetch (Astragalus convallarius var. finitimus) and the Tunnel Springs beardtongue (Penstemon concinnus). Detailed field study is scheduled to be performed in order to identify potential habitat within the region of influence. For greater detail, refer to ETR-17, Protected Species.

Wilderness/Natural Areas

Wilderness resources in Nevada and Utah within a 100 air-mile radius of the potential Beryl OB site are listed in Table 3.4.1.2.4-1. Significant natural areas within a 50 air-mile radius of the site are listed in Table 3.4.1.2.4-2.

Human Environment (3.4.1.3)

The following sections describe baseline socioeconomic and cultural characteristics of the Beryl Operating Base Vicinity Environment. Included are: Employment, Income and Earnings, Public Finance, Population, Housing, Community Infrastructure, Traffic and Transportation, Energy, Land Ownership, Land Use, Native Americans, and Archaeological/Historical Resources.

Employment and Labor Force (3.4.1.3.1)

The site for the Beryl OB option is located in Iron County in the southeastern section of the Nevada/Utah region of influence (ROI). The specific area of analysis (AOA) is comprised of Beaver, Iron, and Washington counties in Utah and Lincoln County in Nevada. A detailed analysis of the employment and labor force in the AOA appears in Section 2.1.3.1 of ETR-44. For Alternatives 3 and 4, the Beryl site would be used as a first OB and under Alternative 1 this site would become a second OB. Other alternative OB sites include Coyote Spring and Ely, Nevada; Millard and Delta, Utah; Clovis, New Mexico; and Dalhart, Texas.

Recent Labor Force Trends

Beaver County

The size of the labor force in Beaver County has remained relatively stable over the 1968-80 period, ranging from 1,630 workers in 1970 to 2,060 in 1979. Between 1975 and 1980, the labor force averaged 1,920 workers. Employment levels have also remained relatively stable, ranging from 1,540 persons in 1970 to 1,960 persons in 1979. The number of employed workers living in the county decreased from 1979 to 1980 by 250, to 1,710 persons.

Unemployment in the county peaked in 1975 when 160 persons were without work. The unemployment rate during that year was 8.4 percent. Since 1975 unemployment in the county has decreased steadily, reaching in 1980 its lowest level in a decade, when 95 persons or 5.2 percent of the labor force were unemployed.

Iron County

The Iron County labor force has experienced steady growth throughout the 1968-80 period, increasing by 60 percent during that time. The county labor force reached a peak of 7,500 workers in 1980. Employment levels showed the same trend

Table 3.4.1.2.4-1. Wilderness resources within a 100 air-mile (160.9 km) radius from the potential Beryl OB site¹ (Page 1 of 2).

State	Wilderness Resources	
	Approximate Miles From OB Site	Approximate Km From OB Site
Nevada		
White Rock Range	28	45
Tunnel Spring	33	53
Parsnip Peak	34	55
Mountain Home Range	40	64
Table Mountain	44	71
Grapevine Spring	50	81
Fortification Range	59	95
Highland Ridge	64	103
Meadow Valley Mountains	68	109
Mormon Mountains	70	113
Wheeler Park	74	119
Mount Grafton	75	121
Weepah Spring	75	121
Far South Egan	78	125
Delamar Mountains	79	127
South Pahrocs/Hiko	80	129
South Egan Range	88	142
Nevada, Desert National Wildlife Range	92	148
Evergreen	92	148
Evergreen	96	155
Evergreen	97	156
Mount Moriah	93	150
Medsger Pass	94	151
Lower Pahrnagat Lake	94	151
East Pahrnagat	100	161
Utah		
Central Wah Wah Range	30	48
Pine Valley Mountain	32	51
Spring Canyon	35	56
Zion	36	58
La Verkin Creek Canyon	41	66
Taylor Creek Canyon	41	66
Wah Wah Mountains	43	69
Ashdown Gorge	43	69
Bear Trap Canyon	44	71
Red Mountain	44	71
Cedar Break	45	72
Red Butte	45	72
Cottonwood Canyon	48	77

Table 3.4.1.2.4-1. Wilderness resources within a 100 air-mile (160.9 km) radius from the potential Beryl OB site¹ (Page 2 of 2).

State	Wilderness Resources	
	Approximate Miles From OB Site	Approximate Km From OB Site
Utah (continued)		
Goose Creek Canyon	50	81
Deep Creek	50	81
North Fork Virgin River	54	87
Orderville Canyon	57	92
The Watchman	61	98
Parunuweap Canyon	63	101
Canaan Mountain	64	103
King Top	64	103
Red Canyon North	71	114
Red Canyon South	71	114
Moquith Mountain	78	125
Notch Peak	79	127
Bryce Canyon	83	134
East of Bryce	86	138
The Blues	88	142
Paria-Hackberry	90	143
Conger Mountain	90	145
Howell Peak	94	151

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¹Wilderness resource areas outside the states of Nevada and Utah were not included in this evaluation.

Table 3.4.1.2.4-2. Significant natural areas within a 50 (80 Km) air-mile radius of the potential Beryl OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	Km
Nevada		
Clover Creek and Mountains	35	55
Utah		
Steamboat Mountain	10	15
Indian Peak Wildlife Management Area	25	40
Ripple Arch	45	70
Red Mountain	45	70
Desert Range Research Natural Area	50	80
Desert Experimental Range	50	80
Inverted Valleys, St. George	50	80

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during the study period, although 1980 employment dropped by 150 workers from the previous year.

The unemployment rate has ranged from 4.1 percent in 1969 and 1971 to 6.7 percent in 1975, 1976, and 1980. In 1980, 503 workers living in the county were unemployed, a 50 percent increase over 1978 and 1979.

Washington County

The size of the labor force in Washington County has doubled since 1968, from 4,470 workers in that year to 9,060 in 1980. Both labor force and employment levels have increased steadily throughout the study period. The number of employed workers living in the county reached 8,590 in 1980.

The county's unemployment rate reached 7.4 percent in 1975, the highest annual rate since 1968. Unemployment levels decreased during the following years to 3.9 percent in 1978 and 1979. In 1980, 470 persons living in the county were unemployed, an unemployment rate of 5.2 percent.

Lincoln County

The labor force in Lincoln County showed no significant trend from 1968 to 1974, when the number of workers in the county rose by 20 percent over the 1973 level. The county labor force increased from 1,000 workers in 1973 to 1,300 in 1975, to 1,430 in 1978, and to 1,570 in 1980. The unemployment rate was above 10.0 percent during four of the years 1968-73, but has been below 4 percent since 1978. The average annual unemployment rate between 1975 and 1980 was 5.3 percent.

Projected Employment

While economic growth has been relatively slow, expansion of mineral production and the development of energy resources may occur in the county in the near future. Expanded alunite mining and processing is possible in Beaver County. About 1,000 workers would be employed in mining, milling, and processing 12,000 tons of ore per day beginning in 1986 and continuing through the mid-1990s. A second major potential development--the Pine Grove Molybdenum Project (PGMP)--includes mining and milling of 10,000-30,000 tons of ore per day. PGMP would employ about 500 workers beginning in 1982 increasing to around 700 in 1984 and continuing at that level through 1994. In addition, geothermal energy exploration and construction of a 20-megawatt plant at Roosevelt Hot Springs would provide about 100 jobs through 1994. Employment growth in the mining and energy industries will spur additional growth in other industries in the county. The trade, services, and construction sectors will receive much of this induced employment. Employment projections for Beaver County with and without these developments are presented in Section 3.2.3.1.2.1.

In addition, Table 3.4.1.3.1-1 presents projections of employment for 1982-94 in Beaver County for three sectors which would be most affected by M-X-construction, trade, and services. These projections are displayed for both trend-growth (Baseline 1) and high-growth (Baseline 2) conditions. With the trend-growth projection, growth would be most rapid in services-- an average of 2.8 percent per year, compared to 2.6 percent for construction and 2.0 percent for trade. The rapid

Table 3.4.1.3.1-1. Projected employment in construction, trade, and services in Beaver County under trend-growth and high-growth conditions, 1982-94 (number of jobs).

Year	Trend-Growth			High-Growth		
	Construction	Trade	Services	Construction	Trade	Services
1982	58	372	231	293	457	313
1983	60	384	242	1,076	556	411
1984	63	397	255	1,322	622	472
1985	65	410	268	1,703	666	554
1986	67	417	274	2,050	722	593
1987	68	424	279	1,189	631	498
1988	69	430	284	144	638	499
1989	70	437	291	146	650	504
1990	72	443	296	144	659	527
1991	74	451	302	152	674	530
1992	75	458	309	153	686	549
1993	76	466	316	162	699	550
1994	79	474	322	159	704	568

T5532/9-23-81/F

Note: Projections are presented to nearest job only for convenience in review, and do not imply this level of accuracy.

Source: University of Utah, Bureau of Economic and Business Research
1980.

build-up of construction employment is visible in the high-growth projection, with a peak of 2,000 construction jobs (without M-X) in 1986. This is followed by a projected loss of 1,900 construction jobs between 1986 and 1988 as the high-growth projects enter their operations phases. Employment projections for trade and services follow a similar pattern, but with a much smaller boom-bust fluctuation expected. However, the mining and energy projects could continue to produce a significant degree of dislocation in the county economy as firms attempt to adjust to local labor shortages, wage escalation, and in-migration of new workers in key occupations. After 1988, Beaver County is projected to grow much more slowly.

Construction, trade, and services employment projections for Iron and Lincoln counties are presented in Table 3.4.1.3.1-2. Only the trend-growth baseline is presented since the high-growth projection is not significantly different. In Iron County, services, construction, and trade employment levels are projected to increase at an annual average rate of 3.3, 3.0, and 2.6 percent, respectively, between 1982 and 1994. In Lincoln County, employment growth is not projected to occur as rapidly as in Iron County. The annual average growth rate for services, construction, and trade employment are projected at 2.8, 2.7, and 2.2 percent, respectively. Washington County was not included in the M-X region of influence by the Bureau of Economic and Business Research (BEBR) and therefore employment projections by sector for that county were not included in their analysis.

Income and Earnings (3.4.1.3.2)

This section presents baseline income and earnings data for the counties potentially affected by proposed operating base locations. Location of an operating base at Beryl would most affect Iron, Beaver, Washington, and Lincoln counties. Detailed baseline earnings data by major industrial sector can be found in ETFs 2B, 2E, 2G, and 2K.

Iron County

Iron County earnings amounted to \$70.9 million in 1979. Government employment is the single largest source of earnings, \$17.6 million in 1979, or approximately 25 percent of total county earnings. Retail trade earnings are second, accounting for \$11.5 million in 1979, or 16.3 percent of total county earnings.

Personal income per capita amounted to approximately \$5,358 in 1979 and reflects steady growth over the 1969-79 period. Similarly, earnings per worker exhibit lower levels (\$9,876) than state-wide rates (\$11,951). See Section 3.2.3.2.

Beaver County

Total earnings in Beaver County amounted to \$16.5 million in 1979. While no one economic sector dominates the Beaver County economy, earnings generated in the transportation and public utilities, government (principally state and local government), and retail trade sectors contributed the majority of earnings in the county in 1979.

Beaver County per capita income was 87.8 percent of the state average in 1971 and had declined to 77.4 percent of the state average by 1979. Similarly,

Table 3.4.1.3.1-2. Projected trend-growth employment in construction, trade, and services in Iron and Lincoln counties, 1982-1994 (number of jobs).

	Iron County			Lincoln County		
	Construction	Trade	Services	Construction	Trade	Services
1982	492	1,661	895	21	233	162
1983	513	1,722	940	21	238	168
1984	536	1,786	989	23	246	175
1985	559	1,856	1,042	24	255	181
1986	575	1,898	1,071	25	260	186
1987	589	1,941	1,100	25	263	190
1988	604	1,986	1,130	25	269	195
1989	620	2,031	1,161	26	275	200
1990	637	2,078	1,193	26	281	206
1991	563	2,119	1,222	28	286	211
1992	669	2,164	1,253	28	293	216
1993	685	2,208	1,284	28	298	222
1994	701	2,251	1,314	29	304	226

T5912/10-2-81

Note: Projections are presented to nearest job only for convenience in review and do not imply this level of accuracy. Trend-growth projections only are presented for Iron and Lincoln counties since high-growth projections are not significantly different.

Source: University of Utah, Bureau of Economic and Business Research, 1980.

earnings (total wage and salary disbursements) per worker is substantially lower than state averages--\$9,540 in 1979, compared to \$11,951 for the state as a whole (see Section 3.2.3.2).

These data reflect a relatively weak economy in Beaver County. Approximately 22.2 percent of the personal income generated in Beaver County is from transfer payments.

Washington County

Washington County earnings stood at \$74.7 million in 1979, slightly larger than Iron County's \$70.9 million. Total county earnings grew at an average annual rate of 18 percent from 1974 through 1979, significantly above the state average annual earnings growth rate of 13 percent. Retail trade was the leading source of county earnings in 1979, accounting for 19 percent of total earnings. Services and state and local government were also important earnings sources in the county, accounting for 16 percent and 15 percent, respectively. Average wage and salary earnings per worker (excluding other labor income) in Washington County was about \$9,300 annually in 1979, 78 percent of state average earnings per worker.

Washington County's aggregate personal income of \$124.4 million in 1979 was the highest among the rural Utah ROI counties. However, per capita income in Washington County is significantly below the state average, amounting to \$5,506 in 1979.

Lincoln County

Total earnings in Lincoln County amounted to approximately \$18.4 million in 1979. Although immediately adjacent to Clark County, Nevada, Lincoln County does not enjoy the benefits of a particularly strong tourist or gaming industry. Earnings generated in the mining sector have contributed greatly to earnings growth, particularly in the 1977-79 period. Earnings generated in the government sector, principally at the state and local level, historically has been the largest single earnings source in the county.

Personal income per capita in the past has been substantially below both the U.S. and Nevada averages. Lincoln County has made substantial gains in per capita income since 1976. Income per capita in 1979 stood at \$7,619.

In 1979 total earnings (wage and salary disbursements) per worker stood at approximately \$13,097 compared to a state of Nevada average of \$13,111 (see Section 3.2.3.2). Continued earnings growth in Lincoln County will depend on expansion of mining activities, although agricultural and manufacturing sectors could contribute substantially.

Public Finance (3.4.1.3.3)

Beryl

Annual revenue and expenditure growth rates for Iron, Washington, Beaver, and Lincoln counties, and for selected communities in these counties, are presented in Table 3.4.1.3.3-1. Only data for the larger communities are presented. Additional data are presented in ETRs 2B, 2E, 2G, and 2K.

Table 3.4.1.3.3.1. Recent annual growth rates and percentage shares of specific revenues and expenditures by category, for selected counties and communities.

Counties	Total Revenues		Property Tax Revenues		Intergovernmental Transfers		Total Expenditures		Public Safety Expenditures	
	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Expenditures	Annual Rate	Percent of Total Expenditures
Iron, Utah ²	17.9	26.2	2.2	32.5	43.1	14.2	28.2	15.3		
Washington, Utah ⁵	25.1	30.1	10.5	13.1	35.7	10.5	46.8	10.5		
Beaver, Utah ²	18.5	16.0	1.1	30.2	56.1	15.1	16.0	15.8		
Lincoln, Nevada ⁴	12.0	26.6	16.7	6.8	44.8	16.3	18.8	31.7		
Communities										
Cedar City, Utah ⁵ (Iron County)	9.9	N/A	N/A	4.0	22.1	3.7	17.5	21.4		
St. George, Utah ⁶ (Washington County)	27.6	16.8	9.8	8.7	25.6	30.2	8.9	25.8		
Hurricane, Utah ⁷ (Washington County)	30.1	18.3	4.7	22.2	16.0	19.6	3.0	23.2		
Milford, Utah ⁸ (Beaver County)	19.7	33.5	8.3	19.9	33.9	23.8	15.7	32.3		
Beaver City, Utah ⁹ (Beaver County)	1.0	25.5	4.0	-3.0	14.9	11.5	10.4	16.1		
Caliente, Nevada ² (Lincoln County)	7.4	18.6	12.9	4.4	63.4	8.7	5.8	57.3		

T540/9-3-81

¹ Annual compound rate of change.

² Fiscal Year 1976-1979.

³ Fiscal Year 1975-1978. Calculations do not include transfer of \$1,035,000 in FY 1978-79. Intergovernmental transfers based on FY 1976-1978.

⁴ Fiscal Year 1974-1975 to FY 1979-1980.

⁵ Fiscal Year 1975-1976 to 1979-1980. Property tax revenues not available from existing data.

⁶ Fiscal Year 1976-1977 to FY 1978-1979.

⁷ Fiscal Year 1977-1978 to FY 1978-1979. Calculation does not include transfers out of \$26,622 in FY 1977-1978 and \$107,002 in FY 1978-1979.

⁸ Fiscal Year 1974-1975 to FY 1978-1979. Does not include transfer out of \$139,107 in FY 1978-79.

⁹ Fiscal Year 1974-1975 to FY 1978-1979. Does not include "Transfers" and "Other" category.

Iron County has recently experienced revenue growth of 17.9 percent annually, and expenditure growth of 14.2 percent annually. Cedar City has experienced slower annual growth rates of 9.9 percent in revenues and 3.7 percent in expenditures. Similar growth is evident in the separate revenue and expenditure categories.

Revenue sources and public service expenditures vary widely among county and city governments. Cedar City obtains 77.9 percent of its revenues from property and other taxes, and from fees and fines, and 22.1 percent from state and local governments (see Table 3.4.1.3.3-1). Iron County obtains only 26.2 percent of its revenue from property taxes, and 43.1 percent from intergovernmental transfers.

In both Iron County and Cedar City, expenditures are mostly in the areas of public safety and public works. Public safety outlays represent 21.4 percent of expenditures in Cedar City and 15.3 percent in Iron County. Public works outlays represent 35 percent of expenditures in both Cedar City and Iron County.

In Washington County, property taxes account for 30.1 percent of revenues (see Table 3.4.1.3.3-1). In St. George, property taxes account for 16.8 percent of revenues, and in Hurricane, 18.3 percent. Other sources of revenue which offset relatively low property tax revenues are sales and use taxes, and fines, fees and service charges. The major difference between the counties and the cities is in dependence on federal and state governments for revenue. Washington County receives 35.7 percent of its revenues from intergovernmental transfers, while St. George receives 25.6 percent and Hurricane receives 16.0 percent.

St. George and Hurricane allocate more funds to public safety (25.8 percent and 23.2 percent respectively) than Washington County (10.5 percent). Public works and administration are also areas of major expenditures. Table 3.4.1.3.3-1 presents annual growth rates by revenue and expenditure categories for Washington County, St. George, and Hurricane. Additional revenue and expenditure data tables for Washington County are presented in ETR-2K.

Beaver County, like other Utah counties, depends heavily on intergovernmental revenues, while Beaver City and Milford depend more heavily on revenue generated from property taxes. Property taxes account for only 16.0 percent of total revenue in Beaver County. In Beaver City and in Milford, property taxes account for 25.5 percent and 33.5 percent of revenue, respectively (see Table 3.4.1.3.3-1). In Beaver County, intergovernmental revenues accounted for 56.1 percent of total revenues during fiscal years 1976-79. Beaver City and Milford rely less on these sources, at 14.9 percent and 33.9 percent respectively. Sales and use taxes, and fines, fees and service charges in Beaver City and Milford offset the reduced dependence on intergovernmental revenues.

The greatest expenditures in Beaver County and Milford are in public safety and public works. In Beaver City, the largest expenditures are for administration, and for parks, recreation and culture. Cities have different priorities and different needs in providing public services. For example, in Beaver County, public safety accounts for 15.8 percent of total expenditures, while in Milford, it accounts for 32.3 percent. Table 3.4.1.3.3-1 presents growth rates and revenue and expenditure categories for Beaver County, Beaver City and Milford. Beaver County and Milford have recently experienced revenue growth rates of 18.5 and 19.7

percent per year, respectively, while expenditures have increased in these jurisdictions at 15.1 and 23.8 percent per year. Beaver City has experienced an insignificant revenue growth rate of 1.0 percent but a much higher expenditure growth rate of 11.5 percent. The amount of inter-governmental revenue received by Beaver City has declined at an average annual rate of 3 percent during recent years.

Table 3.4.1.3.3-1 also presents information on recent growth rates in revenues and expenditures for Lincoln County, Nevada and the City of Caliente for fiscal years 1974-75 through 1979-80. Additional data are presented in a supplemental technical report, ETR-2G. Property taxes contribute only moderately to revenues in both the county and the city--18.6 percent in Caliente and 26.6 percent in Lincoln County. Revenues from the State of Nevada, principally from cigarette, liquor and motor vehicle taxes, account for a large share of revenues for both the county and the city--44.8 percent in Lincoln County and 63.4 percent in Caliente.

In both Lincoln County and Caliente, the largest expenditure is in public safety. In Lincoln County, public safety accounts for 31.7 percent of total expenditures. Caliente spends 57.3 percent on public safety.

In Lincoln County, revenues have grown at an average annual rate of 12.0 percent and expenditures at 16.3 percent. In Caliente, revenues and expenditures have grown at 7.4 percent and 8.7 percent, respectively. Expenditure patterns, by category, are similar for both the county and the city.

Detailed school district revenues and expenditures for Iron, Washington, Beaver and Lincoln school districts are presented in ETRs 2B, 2E, 2G, and 2K. Major trends in these data are summarized in Table 3.4.1.3.3-2. Instruction accounts for the largest share (46-49 percent) of school district revenues in Iron, Washington, and Beaver. Instruction represents a greater share in Lincoln County, Nevada, at 53.6 percent. The remaining expenditures are for administration, debt service charges, services (food and transportation), fixed charges (insurance, pension payments), and maintenance and operation of the physical plant. Revenue for the school districts comes from the state (Uniform School Fund in Utah and Distributive School Fund in Nevada), and from local contributions. In all four school districts, most of the revenue comes from the state, ranging from 52.6 percent in Iron County to 62.8 percent in Washington County.

Growth rates for school district revenues and expenditures also are shown in Table 3.4.1.3.3-2. Iron County registered the greatest gains at 16.1 percent for revenue and 19.5 percent for expenditures. Beaver County school district experienced more modest growth, at 10.6 percent and 8.8 percent for revenues and expenditures, respectively.

In Iron, Washington, Beaver, and Lincoln Counties, fiscal structures are not adequate to support moderate growth. Because of the low tax base and reserve bonding capacities of jurisdictions in Washington, Beaver, and Lincoln counties (Table 3.4.1.3.3-3), long-term debt financing of large-scale capital improvement projects is not feasible from local sources of revenue. Reserve bonding capacities (total bonding capacity less outstanding general obligation bonds) range from a low of \$196,000 in Beaver City to \$3.7 million in Washington County. Jurisdictions within Iron County and St. George in Washington County have greater reserve bonding capacities and would be able partially to finance long-term bond

Table 3.4.1.3.3-2. Recent annual growth rates and percentage shares of specific revenues and expenditures by category, for selected county school districts.

	Total Revenue ¹		State Revenues		Local Revenues		Total Expenditures ²		Instruction Expenditures	
	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Expenditures	Annual Rate	Percent of Total Expenditures
Iron County School District	16.1	52.6	16.2	45.7	16.4	45.7	19.5	45.8	12.9	45.8
Washington County School District	7.2	62.8	4.3	31.9	12.3	31.9	14.6	48.8	13.9	48.8
Reaver County School District	10.6	53.4	11.1	41.7	9.0	41.7	8.8	46.8	9.1	46.8
Lincoln County School District	13.6	55.3	12.5	26.7	20.1	26.7	13.4	53.6	12.3	53.6

T5441/9-22-81/F

¹ Does not include non-revenue sources (e.g. sale of property and equipment).

² Does not include capital outlay expenditures.

Source: See ETRs 2B, 2E, 2G, and 2K.

Table 3.4.1.3.3-3. Assessed valuations, indebtedness limitations and revenue bonding capacities, selected local taxing jurisdictions, 1981.

Jurisdiction	Assessed Value	Indebtedness Limitation	Outstanding General Obligation Bonds	Reserve Bonding Capacity
Iron County	78,561,998	6,284,959	325,000	5,959,959
School District	78,561,998	12,569,920	6,115,000 ¹	6,454,920
Cedar City	28,260,689	12,565,131	2,072,000	11,493,131
Washington County	64,733,289	5,178,663	1,450,000	3,728,663
Washington County School District	64,733,289	10,357,326	8,270,000 ¹	2,087,326
St. George	30,651,702	14,712,817	2,500,000	12,212,000
Hurricane	4,029,038	1,933,938	1,296,573	637,365
Beaver County	15,853,367	1,268,269	251,660	1,016,609
Beaver County School District	15,853,367	2,536,539	510,000	2,026,539
City of Milford	2,130,830	1,022,800	206,000	816,800
Beaver City	3,356,249	600,000	404,000	196,000
Lincoln County	33,464,500	3,346,450	42,000	3,304,450
Lincoln County School District	33,464,500	5,019,675	1,500,000	3,519,675
City of Caliente	2,566,126	769,838	0	769,838

T5442/9-3-81

¹School Year 1979-1980

Sources: Utah Foundation, 1981, Statistical Review of Government in Utah, 1981 edition; Nevada, State of, 1981, Local Government Green Book, Department of Taxation.

obligations. St. George, with \$12.2 million in reserve bonding capacity, and Cedar City, with \$11.5 million, are better able to finance major capital improvement projects.

Population and Communities (3.4.1.3.4)

The area of analysis (AOA) for the proposed OB near Beryl, a rural community of fewer than 50 persons in western Iron County, encompasses all or portions of four counties, including Iron, Beaver, and Washington in Utah, and Lincoln in Nevada. The extent of the AOA is determined by the maximum daily commuting zone for direct project workers who would have employment locations on the OB (see ETR-37). With the exception of Beaver County, which grew by just over 15 percent during the last decade, the counties within the AOA experienced extensive growth of more than 40 percent between 1970 and 1980 (see Table 3.4.1.3.4-1). Annual rates of change varied from 1.4 percent in Beaver to 6.7 percent in Washington County, which almost doubled in population during the decade. The area is characterized by very low population densities, varying from a high of 5.6 persons per sq mi in Washington to less than 0.5 persons per sq mi in Lincoln County. The principal communities within the AOA are Cedar City, Parowan, and Enoch in Iron County; Enterprise in Washington; Beaver, Minersville, and Milford in Beaver; and Panaca, Caliente, and Pioche in Lincoln. Detailed information for Beaver County is presented in Section 3.4.5.3.4 and for Lincoln County in Section 3.4.2.3.4.

Iron County

Iron County, which would probably receive the largest share of the population impacts, had 17,349 residents in 1980, of which 10,972 or 63 percent were in Cedar City. The county added about 5,200 residents between 1970 and 1980, an increase of 3.6 percent annually. More than four-fifths of the growth occurred in the Cedar City census county division (CCD) which also includes Enoch and Kanarraville as well as unincorporated developed areas. The Beryl/Newcastle CCD, the sparsely settled western portion where the proposed base would be located, had a population of 755 in 1980, spread among several unincorporated communities including Beryl, Newcastle, Lund, and Modena. The average population density was 5.3 persons per sq mi in 1980. Population in the county is racially and ethnically homogeneous, with blacks comprising 0.1 percent, Native Americans 2.1 percent, and persons of Spanish origin 1.4 percent of the residents. Average household size in Iron County was 3.28 persons per household in 1980 compared to 3.20 in Utah and 2.75 in the nation as a whole.

Housing (3.4.1.3.5)

Over the decade 1970-1980, Iron County, (the potential location of an operating base near Beryl) experienced an average annual compound rate of growth in the total number of housing units of 5.3 percent. The housing stock increased to over 6,200 units in 1980. The majority (57 percent) of the dwelling units in 1980 were located in Cedar City (down from a level of 67 percent in 1970). As of 1980, 75 percent of the housing stock was located in incorporated entities within Iron County (U.S. Department of Commerce, Bureau of the Census, 1981).

In 1980 single family dwelling units constituted 73 percent of the housing stock, with 20 percent in multiple family units and mobile homes. In 1980, 476, or

Table 3.4.1.3.4-1. Population and population change 1970-1980 by county and community within the Beryl OB area of analysis.

County/Community	Population		Change 1970-1980		
	1980	1970	Number	Percent	Annual Rate ¹
Beaver County, Utah	4,378	3,800	578	15.2	1.4
Beaver ccd ²	2,298	-	-	-	-
Beaver city	1,792	1,453	339	23.3	2.1
Milford/Minersville ccd	2,080	-	-	-	-
Milford city	1,293	1,304	-11	-0.8	-0.1
Minersville town	552	448	104	23.2	2.1
Iron County, Utah	17,349	12,177	5,172	42.5	3.6
Beryl/Newcastle ccd	755	557	198	35.5	3.1
Cedar City ccd	14,031	-	-	-	-
Cedar City city	10,972	8,946	2,026	22.6	2.1
Enoch town	678	120	558	465.0	18.9
Kanarraville town	255	204	51	25.0	2.3
Parowan ccd	2,563	1,900	663	34.9	3.0
Brian Head town	77	-	-	-	-
Parowan city	1,836	1,423	413	29.0	2.6
Lincoln County, Nevada	3,372	2,557	1,175	46.0	3.9
Caliente twp ³	1,054	979	75	7.7	0.7
Caliente city	982	916	66	7.2	0.7
Panaca twp	758	539	219	40.6	3.5
Pioche twp	794	641	153	23.9	2.2
Washington County, Utah	26,065	13,669	12,396	90.7	6.7
Enterprise ccd	982	-	-	-	-
Enterprise city	905	844	61	7.2	0.7

T5123/8-21-81

¹ Annual compound rate of change

² Census County Division

³ Township

Sources: U.S. Bureau of the Census, Utah Final Population and Housing Unit Counts, (PHC80-V-46); Nevada Final Population and Housing Unit Counts, (PHC80-V-30), March 1981.

90 percent of the 526 multiple family dwelling units were located in Cedar City. Forty-three percent of the 661 mobile homes in the county are located in unincorporated portions of the county. Mobile homes presently make up 11 percent of the existing housing stock (M-X Missile Policy Board, 1981).

Over the period 1970-1979 an annual average of 150 building permits for housing construction were issued. During the peak year of construction activity (1978) just over 300 units were authorized. The ten-year cumulative total was 1,498 authorized units, and of these 80 percent were single family structures (U.S. Department of Commerce, Bureau of the Census, 1970 to 1979, inclusive).

It is estimated that 1,115 vacant residential lots in the county are accessible to water and sewer hookups (Hammer, Siler, George Associates, 1981). Various modes of financing were used: conventional home financing; Farmers Home Administration (FmHA); and Utah Housing Finance Agency.

Iron County is projected to experience an average annual rate of growth of its housing stock of 2.4 percent over the period 1982-1994 under trend-growth conditions. This equates to an increase of 1,968 units from a base in 1982 of 5,890 units. Under high-growth conditions, the increase amounts to 1,994 units from a base of 5,906 units in 1982, with an average annual rate of growth over the period 1982-1994 of 2.5 percent, (refer to Table 3.2.3.4.2-1). These rates of change compare with 2.7 and 2.8 percent, respectively, for trend- and high-growth projections for the deployment region.

Community Infrastructure (3.4.1.3.6)

Education

During the 1980-1981 school year, the Iron County School District had a total enrollment of 4,245 pupils and employed 185 teachers. These enrollments are distributed among six elementary schools, which have a combined total enrollment of 2,350 pupils, and three junior/senior high schools with a total enrollment of 1,895 pupils. Enrollments have increased by eight percent since 1978-79. Iron County has space for an additional 1,222 students in the junior/senior high schools and 260 additional students in the elementary schools (Iron County School District, 1981).

Health Care

The Valley View Medical Center in Cedar City (Iron County) contains 72 beds, with a current annual average occupancy rate of 36 percent. The Medical Center serves southern Utah and eastern Nevada. The Valley View Clinic, Brown Clinic, and Cedar City Clinic also serve the county from Cedar City. Medical services are provided by 14 physicians, 8 dentists, 50 nurses, 2 mental health workers, and several other health care professionals. The Iron County ambulance service consists of five ambulances manned by volunteer emergency medical technicians (Valley View Medical Center, 1981).

The Dixie Medical Center in St. George (Washington County) is the largest hospital in the area and attracts patients from surrounding Lincoln, Iron, and Beaver counties, and the rural areas of Clark County. Present capacity is 65 beds, with plans for expansion to 106 beds. The hospital has 27 physicians, 69 RNs and 24 LPNs, and other health care personnel (Dixie Medical Center, 1981).

Police Protection

The Iron County Sheriff's office currently provides county-wide coverage. Police personnel include 10 officers, each equipped with a patrol car. The Sheriff's office provides enforcement coverage for the community of Kanarrville and handles most of the cases in Enoch, Paragonah, and Brian Head even though these communities each have a town marshal. Of these three communities, only Enoch has a patrol car. The county jail facilities located in Cedar City serve all communities in Iron County. The Cedar City police department has 15 officers and 14 patrol cars. Parowan has two full-time and one part-time officer, each equipped with a patrol car. Justice is administered by the Cedar City Court, a juvenile court in Cedar City, and Justices of the Peace in some of the communities (M-X Missile Policy Board, 1981).

Fire Protection

In Iron County each community provides its own fire protection services, with the exception of Enoch. The Cedar City fire department consists of 3 full-time and 32 volunteer firemen operating from one station. The city has a fire insurance rating of five. (A lower number on the national scale of 1-10 indicates that a community has better fire protection in terms of the number of trained firemen, equipment, fire hydrants, water storage and flow capacity.) Major equipment consists of two 1,250-gallon pumpers, two 750-gallon pumpers, two brush trucks, and one snorkel truck. Parowan has 25 volunteers and a fire rating of eight. The fire rating is eight in Brian Head, nine in Kanarrville and nine in Paragonah (M-X Missile Policy Board, 1981).

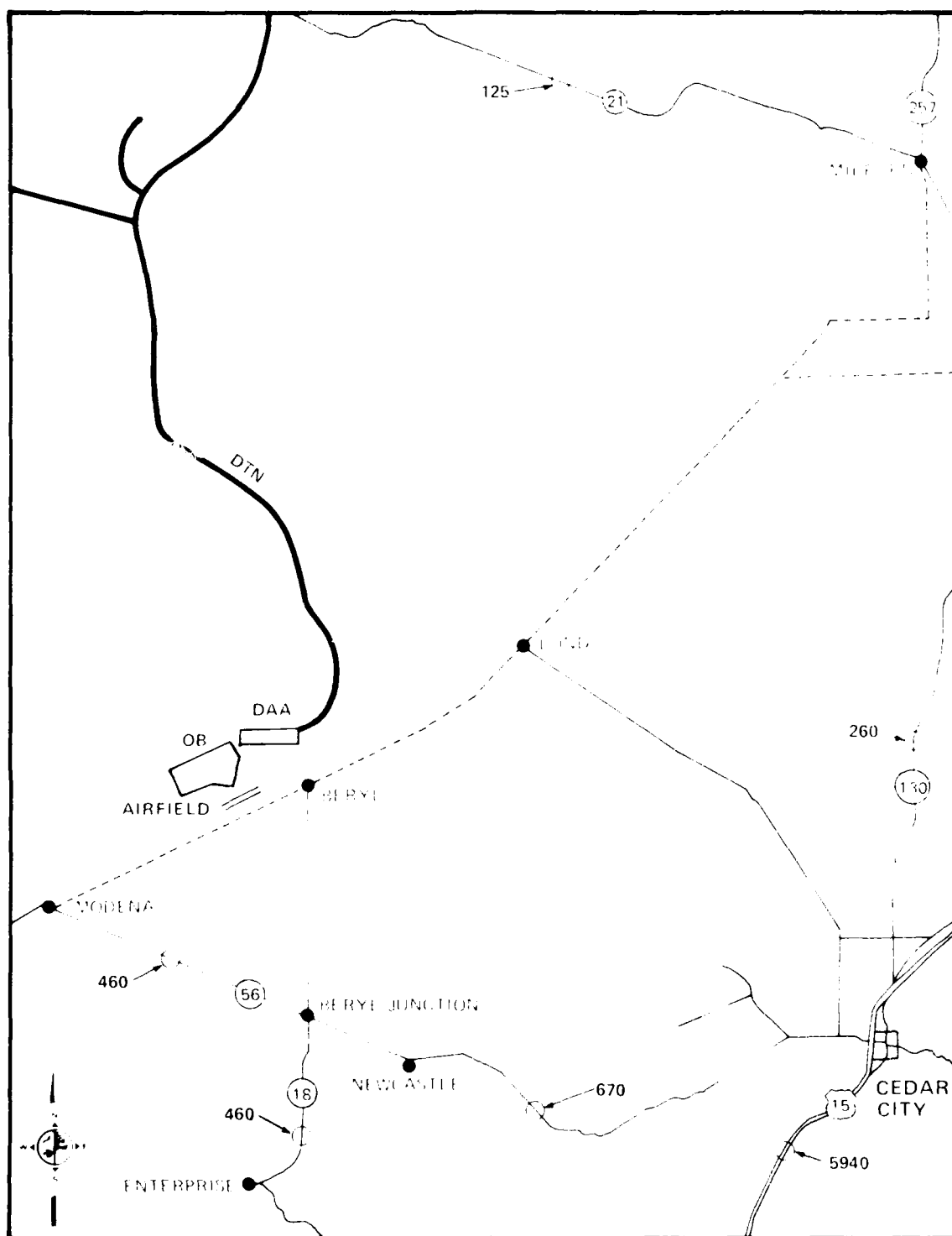
Traffic and Transportation (3.4.1.3.7)

The proposed site is in an undeveloped area in southern Utah. Primary access is via a 12-mi-long paved road, which runs north from the intersection of State Highway 56. The area is also adjacent to an unpaved road connecting Milford, 50 mi northeast of Beryl, with Modena, 15 mi to the southwest. A schematic map of the road network in the vicinity is shown in Figure 3.4.1.3.7-1; also shown are 1978 traffic volumes for the major routes.

The road between Beryl and Beryl Junction is a low-volume county road. Existing traffic volumes are unknown. State Highway 56 is a good quality two-lane road with an average daily traffic of 460 vehicles near Beryl Junction. Cedar City is 43 mi to the east along this route. State Highway 18 is a good quality two-lane road, which passes through St. George 60 mi to the south.

There are two small rural towns near Beryl Junction, Newcastle, and Enterprise, which lie on State Highway 56 and 18, respectively. There are a number of small communities west of the proposed site along State Highway 56. These include Pioche, Panaca, and Caliente.

The proposed site is adjacent to the Union Pacific railroad line which connects Salt Lake City, Utah, and Las Vegas, Nevada. Limited commercial airline service is available at Cedar City.



LEGEND 000 1978 TRAFFIC VOLUMES BERYL, UTAH
 SOURCE: UTAH DEPARTMENT OF TRANSPORTATION

Figure 3.4.1.3.7-1. Existing traffic volumes in the vicinity of Beryl.

Energy (3.4.1.3.8)

Beryl has no natural gas service. Service could be extended into the area by Mountain Fuel Supply (MFS) in Salt Lake City, but there are presently no plans for such expansion. Pacific Gas Transmission (PGT), a subsidiary of Pacific Gas and Electric in San Francisco, has proposed to build a 36-in. high-pressure natural gas transmission line from southwest Wyoming, passing east of Provo, Utah near the Strawberry Reservoir, passing northwest of Cedar City through southern Nevada and terminating at existing pipeline facilities west of Needles, California. This line will have sufficient capacity to transport natural gas to Beryl, which is approximately 20 mi west of the proposed pipeline route.

Home energy requirements in Beryl are supplied by bottled gas, fuel, oil, and electricity. The fuels are trucked from bulk fuel handling terminals in Las Vegas and Salt Lake City to regional distribution centers in St. George and Cedar City.

Electrical energy is supplied by Dixie-Escalante Rural Electric Association, Inc., which has a peak system demand of approximately 20 MW. The utility purchases its power from the Western Area Power Administration and the Department of Energy. Beryl is served by a 12.5 kV rural distribution line.

Land Ownership (3.4.1.3.9)

Forty-eight percent of the suitability zone for the proposed Beryl OB is privately owned. The closest point of the suitability zone is about 25 mi north west of Cedar City on relatively flat private, state, and federal lands. Land ownership in Iron County is comprised principally of federal lands (58 percent), with state and private shares comprising 6 percent and 36 percent, respectively.

Land Use (3.4.1.3.10)Urban Land Use

The location of an OB near Beryl would affect urban land use mainly in Iron County. Some spillover effects would also be felt in Beaver and Washington counties in Utah and Lincoln County in Nevada. Urban land use data for these counties is provided or referenced below.

Iron County

In 1972 Iron County, in conjunction with its incorporated communities, contracted for the preparation of master plans for the incorporated and unincorporated areas of the county. This plan is still in effect in the unincorporated areas of the county and the towns of Kanarrville and Paragonah. The county also set goals and established policies for development as part of the master plan program. (ETR-36, "Urban Growth and Planning," includes an analysis of those goals and policies relevant to the M-X program plus a more detailed discussion on land use planning in Iron County.) The Iron County zoning ordinance, aimed at implementing the master plan, was adopted in 1973. Data on the adoption dates of the master plans, zoning, and subdivision ordinances for the Iron County communities is provided in Table 3.4.1.3.10-1.

Table 3.4.1.3.10-1. Status of adoption of plans and ordinances in Iron and Washington Counties, Utah.

Jurisdiction	Master Plan		Zoning Ordinance		Subdivision Ordinance	
	Date Adopted	Notes (Expected Date of Completion)	Date Adopted	Notes (Expected Date of Completion)	Date Adopted	Notes (Expected Date of Completion)
Iron County	1973		1962			
Cedar City	1979		1972	Under revision	1972	Under revision
Brian Head	1980		No ordinance			Under revision
Enoch	1973	Under revision (September 1981)	ca 1970	Under revision (September 1981)	ca 1970	Under revision (September 1981)
Kanarraville	1973					
Paragonah	1973		ca 1975			
Parowan	1973	Under revision (1981)	1981	Under revision (1981)	1981	Under revision (1981)
Washington County	1972	Under revision (Late 1981)	1973	Under revision (Late 1981)	N/A	
Enterprise	1981			(1981)		(1981)
Hurricane	1979	Revised in 1980	1979	Under revision	1977	Under revision
St. George	1980		1981		1981	

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N/A - Not Available

Cedar City is the largest community in Iron County in terms of total land area (almost 4,700 acres), and vacant land (1,920 acres) (see Table 3.4.1.3.10-2 for existing land use data on Cedar City and other Iron County communities). Cedar City has also undergone the largest amount of growth in the past several years by expanding from a developed area of approximately 1,500 acres in 1972 to over 2,000 acres in 1979. Enoch, 5 mi to the north of Cedar City has become a residential suburb through annexation of several 80 to 100 acre tracts of residential land. These additions have enabled Enoch to grow from about 20 acres of developed land in the early 1970's to over 400 acres in 1981. Parowan and Paragonah, by their locations equi-distant from Milford and Beryl, may be subject to urban growth from an OB at either site. Parowan's land area, approximately 2,200 acres, is dominated by agricultural land uses. Kanarrville and Brian Head are the smallest incorporated communities in Iron County, while the unincorporated communities of Beryl and Newcastle are the closest rural settlements to the OB site. Beryl serves the ranching and farming activities in the Escalante Valley.

Beaver County

Beaver County discussion is provided under Milford OB (Section 3.4.5.3.10).

Washington County

Washington County, Utah is adjacent to Iron County (proposed Beryl OB site) and proximal to Clark County, Nevada (proposed Coyote Spring OB site). The numerous communities in the county range in size from small settlements with urban land areas (exclusive of streets) between 30 to 40 acres to St. George with a land area approaching 13,000 acres. Gunlock, Ivins, Leeds, Pine Valley, Pintura, Rockville, Santa Clara, Springville, Toquerville, Veyo, and Virgin are rural settlements for local farming and ranching activities and summer home communities for part-time residents.

The land use in the unincorporated communities of Washington County is guided through the Washington County Master Plan, adopted in 1972. This plan was amended in 1980 with an open space element and an existing-conditions element. Implementation of the master plan is handled through the zoning ordinance adopted in April 1973 and amended with a residential estate district in April 1979. See Table 3.4.1.3.10-1 concerning the adoption dates and pending actions for the master plans and ordinances of the communities discussed below.

St. George, the commercial and industrial center of southwestern Utah, has had its recent growth tied to resorts, time-sharing condominiums, and hotels. Over the past ten years this growth has made St. George the largest city in terms of land area in the four-county Utah study region; over 12,800 acres or 20 sq mi. (See Table 3.4.1.3.10-3 for existing land use data on St. George and the other major Washington County communities). As of August 1981, 39 percent of the land was developed for urban purposes including 2,500 acres of parkland. Although vacant land occupies half of the city (almost 6,800 acres), St. George is considering annexations that would more than double its present size. The areas, to be considered as two annexation proposals, have a total acreage of about 32 sections or 20,480 acres. The sections lie to the south of the city and extend to the Arizona state line.

Table 3.4.1.3.10-2. Existing land use in Iron County, Utah.

Land Use	Cedar City		Enoch		Kanarrville		Newcastle		Paragonah		Parowan		Iron County Total	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Single Family	569.5	12.1	226.1	12.9	12.8	4.5	9.2	3.3	30.0	10.1	231 ¹	10.3	1,078.6	11.3
Mobile Home	59.8	1.3	23.0	1.3	1.8	.6	1.0	.4	2.6	.9	--	--	88.2	.9
Multi-Family	33.9	.7	--	--	--	--	--	--	--	--	--	--	33.9	.4
Commercial	181.4	3.9	3.8	0.2	.9	.3	--	--	.8	.3	19	.8	205.9	2.2
Public	186.0	4.0	4.2	0.2	--	--	--	--	--	--	122 ²	5.4	312.2	3.3
Religious	40.5	.9	3.7	0.2	.6	.2	2.7	1.0	.9	.3	--	--	48.4	.5
School	--	--	10.8	0.6	--	--	.7	.2	2.0	.7	--	--	13.5	.1
Industrial	126.5	2.7	2.7	0.2	--	--	--	--	--	--	4	.2	133.2	1.4
Park and Cemetery	144.5	3.1	7.2	0.4	--	--	--	--	2.8	.9	23	1.0	177.5	1.9
Streets	668.7	14.2	131.1	7.5	53.9	18.9	49.2	17.4	70.1	23.7	101	4.9	1,074.0	11.2
Developed Land Subtotal	2,010.8	42.8	412.6	23.5	70.0	24.6	62.8	22.2	109.2	36.9	494	22.0	4,905.6	51.8
Agriculture	769.6	16.4	654.6	37.3	110.5	38.7	63.9	22.6	77.6	26.2	109	4.9	1,785.2	18.7
Vacant	1,917.7	40.8	687.4	39.2	105.0	36.7	156.2	55.2	109.2	36.9	1,633	72.8	4,608.5	48.2
Total	4,698.1	100	1,754.6	100	285.5	100	282.9	100	296.0	100	2,242	100	9,559.1	100

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¹Includes all residential categories.

²Includes airport (80 acres).

Source: University of Utah, 1979, "Cedar City Master Plan"; Five County Association of Governments, 1981 "Enoch Master Plan"; Ibid 1978, "Comprehensive Plan for Planning District Five, Appendices"; Architect/Planners Alliance, 1980, "Parowan, Utah Comprehensive Plan."

Table 3a.1.3.10-3. Existing land use--major communities in Washington County, Utah.

Land Use	Enterprise		Hurricane		La Verkin		St. George		Washington		Total	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Single Family	132.4	16	78.6	4	24.2	1	649.6	5	61.3	3	946.1	5
Multi-family	3.3	--	1.6	--	--	--	105.8	1	0.9	--	111.6	2
Mobile Home	9.9	1	40.8	2	27.8	1	128.8	1	52.0	3	249.3	1
Commercial	5.3	1	6.8	--	4.0	--	195.8	2	4.7	--	216.6	1
Industrial	4.8	--	20.6	1	7.4	--	311.2	2	--	--	344	2
Public	3.8	--	4.8	--	0.6	--	35.8	--	0.4	--	45.4	--
School	4.6	--	23.1	1	--	--	97.3	1	10.8	1	135.8	1
Park	17.1	2	16.1	1	47.4	2	2,563.7	20	12.4	1	2,656.7	13
Religious/Cemetery	13.5	2	1.8	--	1.8	--	65.1	1	--	--	82.2	--
Streets	94.8	11	83.4	5	94.0	4	798.0	6	194.2	10	1,264.4	6
Developed Subtotal	289.4	33	267.6	14	207.2	8	4,951.3	39	337.9	18	6,053.0	30
Agriculture	59.4	7	429.8	24	550.8	22	1,110.6	9	274.8	14	2,425.8	12
Vacant	487.5	59	1,124.1	61	1,774.6	70	6,778.1	52	1,329.6	68	11,493.8	58
Total	846.3	100	1,821.6	100	2,532.6	100	12,840	100	1,942.3	100	19,973	100

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¹Includes 38.7 acres for river.

²Includes acreage for cemeteries.

Sources: Five County Association of Governments, 1981, "Enterprise Master Plan"; Ibid, 1978, "Comprehensive Plan for Planning District Five, Appendices," telephone communication with John C. Wiley and Associates, 5 August 1981.

Washington, directly to the east of St. George, acts as a suburb to the larger city. Hurricane lies 20 miles farther east of St. George. The City of Enterprise in northern Washington County is only 25 mi south of the proposed Beryl OB site. The land area of Enterprise, almost 840 acres, makes it the largest community within 40 mi of Beryl. Although the community has a large number of summer homes, its primary orientation is toward agriculture and farming. The community is expecting to have a surge of growth resulting from the reopening of a nearby silver mine.

Lincoln County

Lincoln County discussions are provided under Coyote Spring OB (Section 3.4.2.3.10).

Grazing

The area around the proposed OB facilities is used mainly for grazing. The OB suitability zone includes all or part of 24 allotments and nearly 13,000 AUMs. These allotments are used by 22 livestock operations.

Agriculture

About 1,000 acres of irrigated cropland are located within the Beryl OB suitability zone, but the remaining approximately 280,000 acres are in grazing land. (see Figure 4.3.3.11-4).

Recreation

Parklands

There are a number of parklands surrounding the proposed Beryl OB site. The majority of these parklands are administered by the National Park Service, the Utah Division of Parks and Recreation, BLM, and the National Forest Service. One national park, Zion, and one national monument, Cedar Breaks, are within the vicinity (approximately 50 mi) of the proposed OB. Zion and Cedar Breaks are well within a day's driving distance and may thus be expected to receive a great deal of the expected increased parkland visitation for the purpose of hiking, sightseeing, snowmobiling, picnicking, snow skiing and camping. Bryce Canyon is more than 50 mi east of the OB site. However, because of its recognized natural beauty and many hiking trails this park is expected to receive something on the same order of visitor use as Zion and Cedar Breaks.

There are two National Forests in the mountains to the east and southwest of Beryl. The Dixie National Forest has developed nine camping areas, three boat launching sites, at least two snowmobile trails, and one downhill skiing resort (Brian Head) (Table 3.4.1.3.10-4). There are three Utah state parks in the vicinity: Minersville Lake, Snow Canyon, and Gunlock Lake State Beach. All three of these parks are approximately 60 mi from Beryl. Gunlock and Minersville lakes add to the supply of water-related facilities for boating, swimming, and waterskiing. There are four Nevada State Parks within a relatively short distance: Cathedral Gorge, Echo Canyon, Beaver Dam, and Spring Valley. All four of these state parks are popular camping areas. Coral Pink Sand Dunes State Reserve, to the south, has a small area (2.3 acres) reserved for dunebuggy riding. This area has dunes outside of

Table 3.4.1.3.10-4. Recreation sites on Dixie National Forest land in the vicinity of Beryl.

Name of Site	Activity	Units	\pm Mi from Beryl
Pine Park	Camping	11 sites	45
	Hunting	--	
Enterprise Reservoir	Camping	21 sites	40
	Fishing	--	
	Hunting	--	
	Boating	1 ramp	
Pine Valley	Camping	60 sites	50
	Fishing	--	
Oak Grove	Camping	9 sites	45
	Hunting	--	
Vermillion	Camping	10 sites	25-30
	Fishing	--	
	Hunting	--	
Panguitch Lake	Camping	69 sites	45
	Fishing	--	
	Hunting	--	
	Boating	2 ramps	
Duck Creek	Camping	95 sites	30
	Fishing	--	
	Hunting	--	
Navajo Lake	Camping	32 sites	50
	Fishing	--	
	Hunting	--	
	Swimming and Boating	1 ramp	
Red Canyon	Camping	30 sites	55
	Hunting	--	

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¹Utah Travel Council (no date given).

the reserve which are a popular ORV recreation site (Utah Outdoor Recreation Agency, 1976).

Snow Related Recreation Facilities

As noted above, facilities for snow skiing are available at Brian Head ski resort as well as Cedar Canyon Ski Area (65 acres). Additional resorts to the north along the Wasatch Range are likely to be popular for weekend or longer trips. The Mount Holly ski area, just to the east of Beaver, is expected to receive use by residents in the proposed ODA. Snowmobile and cross-country trails are maintained in the National Forest lands as noted above.

Water Related Recreational Facilities

Activities such as powerboating, waterskiing, and sailing that require a good deal of surface water area, are only available in lakes or reservoirs. Some of those that are within easy access of Beryl include Enterprise, Minersville, Newcastle Reservoir, Gunlock, and Navajo Lake. Gunlock, Navajo, and Pine Valley lakes provide swimming opportunities as well. There are no developed river-rafting, canoeing, or kayaking facilities in this region; however, there are a number of mountain creeks and the Santa Clara and Beaver rivers may be used for these activities during portions of the year. Nearly all of the above mentioned reservoirs, lakes and rivers provide excellent fishing opportunities.

ORV and Other Forms of Dispersed Recreation

There are two forms of off-road vehicle (ORV) activity sites: intensive and dispersed. Examples of sites intensive ORV use would be dunebuggying, hill climbing, and motocross racing. The sand dunes of the Coral Pink State Reserve are a site of dunebuggy activity, as is the Sand Mountain area (BLM) just east of St. George (Utah Outdoor Recreation Agency, 1976). In the Las Vegas area of Nevada there are a number of popular ORV sites as well. These areas are the closest ORV areas in the region (UORA, 1976).

Site-intensive motorcycle hill-climbing is an activity that has received limited management planning in the past in this area. In general, this type of recreational use can be expected on some of the public lands in the near vicinity of population centers (estimated at a 3 - 10 mi radius) such as Cedar City, Enterprise, Parowan, St. George, and the proposed OB.

One motocross course has been run in the past in the area. The future of this event is unknown; however, with an added population base, interest may grow and support such an event. Much of the flat land immediately around the proposed base is privately owned. If these private lands are fenced or posted, it is likely that there will not be impacts. If these lands are not easily discernible, ORV use on BLM lands may extend onto the private lands and cause conflicts.

ORV trails or four-wheel drive trails are abundant throughout the region. At present, all of the trails on BLM lands are open and a significant portion of the Forest Service and state lands have open trails. Iron County has the greatest amount of ORV trails in this region (1,696 mi). Washington County has the lowest mileage (656 mi) of ORV trails in the region (Utah State University, 1976).

Another dispersed recreation pursuit is hiking. Hiking is generally associated with diversified country and mountain areas. In Washington County there are over 390 mi of hiking trails as compared to 148 mi in Iron County (Utah State University, 1976). National Forest and National Park lands are generally preferred for this type of activity as compared to BLM lands. A possible guiding factor is the fact that a good portion of Iron County is the Escalante Desert, a region of open terrain good for driving but low in water resources and thus not very attractive for cross-country hiking.

Recreation within the OB Suitability Zone

The region of the suitability zone surrounding the proposed OB contains no fishing or concentrated recreation sites (Figure 3.4.1.3.10-1). The surrounding area does provide good hunting for pheasant, deer, antelope, and mourning dove. Most of the land is privately owned and, as such, is not likely to be subject to dispersed recreation activities.

Mining

There are no mining sites in the vicinity. Several uranium mining claims are located filed on the site. Some oil and gas leases have been filed in the area and there are two metallic leases on state land.

Native Americans (3.4.1.3.11)

The OB site is located at the junction of three historic Southern Paiute band territories--the Tonoquints, Kurnoits, and Indian Peak. Five recorded Southern Paiute historic habitation sites are located in the foothill area north of Modena.

Native American Cultural Resources (3.4.1.3.11.1)

Hunting and gathering areas are located in Cedar and Parowan valleys, Fishlake National Forest, Beaver Dam, Cedar Mountains, and Indian Peak. Sacred/ancestral sites are documented throughout Fishlake and at Dixie national forests, the Needle Range, and Cedar and Parowan valleys. There is a high probability of numerous other sites in the area. Additional cultural resource data for a Tier II analysis are being gathered in field studies at colonies and reservations in the area.

Native Americans Land/Water Resources (3.4.1.3.11.2)

Five bands of the Paiute Indian Tribe of Utah reside in southern Utah, three in the vicinity of Beryl and two about 100 mi away.

In 1954, the Indian Peaks, Shivwits, Cedar City, Kanosh and Koosharem bands, which constitute the Nuwuvi Tribe, were terminated from federal trusteeship. For various reasons, they lost most of their land. Currently, the Cedar City Band owns approximately five acres of land; the Indian Peak Band owns no land but retains some mineral and water rights at Indian Peak; the Richfield/Koosharem Band's land consists of a one acre industrial park; the Kanosh Band has 80 acres, largely residential; and, the Shivwits Band, the only band to retain its reservation lands, has 28,160 acres.



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As of April, 1980, the bands have been restored to trust status and they have been promised the return of 15,000 acres, in addition to the lands still held by the bands. The Paiute Indian Tribe of Utah has until 1982 to decide where they will withdraw the land to be converted to trust status.

The Pyramid Lake Paiute Tribe of Nevada own a 40 acre parcel located 20 to 24 mi SSE of the Beryl OB suitability zone in Utah. The property was acquired through a gift deed and is owned in fee. The land is currently unused and no water rights are held by the owners; the Tribal Council is considering the sale or lease of the parcel. Consequently, the siting of an OB near Beryl could increase the value of this property and/or enhance its commercial development potential.

Socioeconomic Resources (3.4.1.3.11.3)

The enrolled populations of the Utah Southern Paiute bands are approximately: Cedar City, 138; Indian Peak, 30; Kanosh, 80; Richfield, 85; and Shivwits, 189. During their quarter century of termination, most of the Paiute Indian Tribe of Utah lost their lands, tribal government atrophied, and the maintenance of archival records was minimal. Although the bands have been in the process of reorganizing for over a year, there are significant deficits in the data on social and economic conditions.

A household survey conducted by the Interim Tribal Council in January of 1981 indicated an average annual per capita income of \$2,124 among the Southern Paiutes in Utah.

Among adult Southern Paiutes, 55 percent are in the labor force and 45 percent are permanently on welfare; 75 percent of the non-Indian adult population is in the labor force. Of the Southern Paiutes in the labor force, 24 percent are unemployed and 32 percent are chronically underemployed. The Indian unemployment rates are six times greater than unemployment rates for the non-Indian residents in the vicinity. Seventy-two percent of employable Southern Paiutes are either unskilled service workers (domestic, food, cleaning services, etc.) or unskilled or semiskilled laborers of various types (farm, construction) (Knack 1981).

The bands of the Paiute Indian Tribe of Utah are impoverished; as a consequence, they are highly mobile. Individuals and families tend to move about frequently, in search of both seasonal and permanent employment. There appears to be also a greater reliance on hunting and gathering for subsistence than elsewhere in the study region.

With reinstatement, a full complement of federal services will once again be available to the Paiute Indian Tribe of Utah. However, it is mistaken to assume that restoration will lead directly to an improvement in the welfare of residents, since reinstatement follows 26 years of political disorganization and demographic dispersion.

Archaeological and Historic Resources (3.4.1.3.12)

The Beryl OB vicinity zone encompasses the Escalante Desert and extends up into the wooded foothills north of the desert. The desert is devoid of water sources such as playas, springs, and perennial streams and, as a result, has a very low density

of sites. However, Modena Draw, located near the southwest corner of the vicinity zone, has an abundance of raw obsidian available for lithic tool manufacture, and large, dense, prehistoric lithic scatters may be numerous in and around this area.

The foothill area may be expected to have a much higher density due to the presence of 11 springs and Pinyon-Juniper woodland. The baseline data indicates that the highest densities occur within one mi of springs and throughout the woodland ecotone. A recent survey of the Beryl OB (EDAW 1981b) verifies these statements, and indicates that large prehistoric habitation sites and small historic camps occur in the pinyon-juniper zone near springs, while a low density of historic homesteads may be expected anywhere on the alluvial slopes of the valley bottom. The presence of Lake Mojave, Pinto, Gypsum, and Elko projectile points documents the presence of Archaic use of the area. Projectile points and ceramics of the Fremont and Paiute culture were recovered, as well as historic remains dating from the late 1800s to the present.

Paleontological Resources

The Beryl OB is on alluvial valleyfill in an area that at one time was inundated by Lake Bonneville. Important vertebrate fossils have been found in scattered locations in the Bonneville sediments.



Forty-eight percent of the Beryl OB suitability zone is private land. Ranch farm houses, some with irrigated agriculture are in the zone.

Coyote Spring



COYOTE SPRING

The area of analysis (AOA) for the Coyote Spring Valley operating base option includes both Clark and Lincoln counties. The AOA is located in the southern portion of the designated region of influence (Figure 3.4.2-1). Las Vegas and North Las Vegas are the major settlements and will receive most emphasis. However, the communities of Caliente, Panaca, and Pioche, in Lincoln County, could also receive project impacts and are included in the AOA.

This section and Chapter 4 detail important environmental characteristics of Coyote Spring Valley and vicinity.

Clark County

Early in the 19th century the groundwater of the meadows of Las Vegas attracted caravans of traders and Mormon colonists. In 1855, Mormons established a settlement on the Las Vegas meadows, occupied and farmed the land, and organized a mission to Christianize the Indians. At the time of the Mormon arrival, Indians were growing wheat. Mormon farmers improved the area's grain crops, processed wild hay and organized cattle ranching. The Mormon settlement proved to be shortlived, 1855-1857, due to internal dissension stemming largely from the possibility of working the lead-silver ore of the area, especially the Potosi lead mine southwest of Las Vegas. Las Vegas continued to be a way point on the Santa Fe trail and later as way station on the Union Pacific Railroad. However, it remained a small town until after World War II.

Lincoln County

In the early 1860s, rich ore deposits began to attract miners to the county. As a result, several towns developed, such as Hiko, Pioche, and El Dorado. Panaca was established by the Mormons as a way station for travelers moving between southern California and Salt Lake City. The county itself was created by the State Legislature in 1867 as the result of the personal efforts of Governor Blasdel. The county was cut from Nye County.

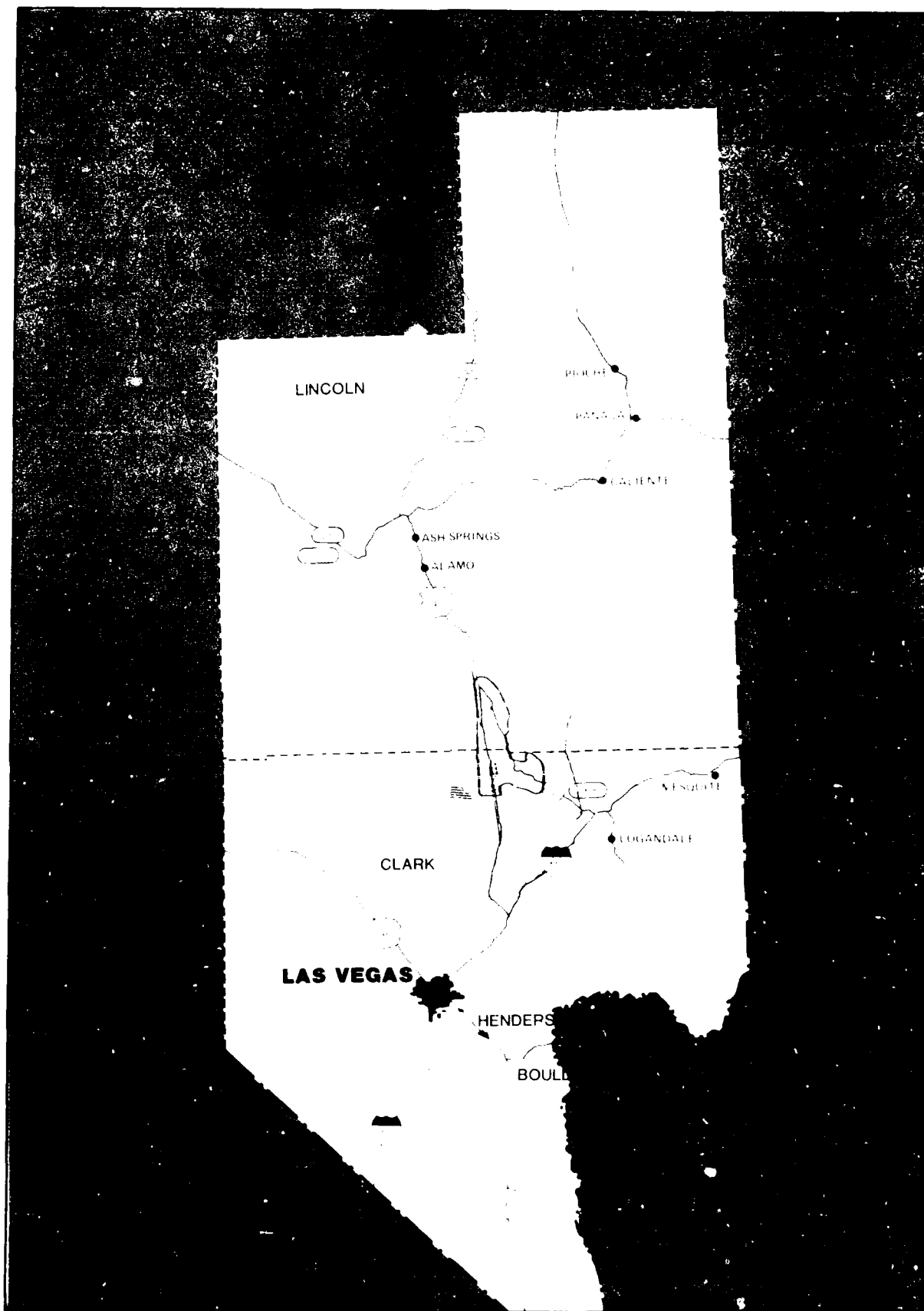


Figure 3.1.1.1. Area of analysis (AOA), Coyote Spring Valley.

Quality of Life: Clark County, Nevada (3.4.2.1)

The physical quality of life indicators describe different variables in five areas: education, population, health, economics, housing, public safety, and recreation (Table 3.4.2.1-1). These indicators, when used in conjunction with views that Clark County residents expressed in the 1979 survey conducted by the Governor's Commission on the Future of Nevada, provide an overall picture of quality of life (QOL), currently existing within Clark County. Use of the Governor's Commission survey requires caution. In 1979, the Governor's Commission on the future of Nevada conducted a survey of residents to elicit their concerns about the present and future of Nevada. It provides information by county, on local values, desires, and the perceptual aspects of community facilities such as education, health, economic growth, public service variables, lifestyle factors, and others. However, since the survey was not conducted scientifically (it was distributed so that every Nevadan would have an opportunity to fill one out with no provisions for controlling for non-response), the results of the survey cannot be interpreted in the same manner as public opinion polls which are based on careful sampling criteria and control for non-response. The results presented below should therefore be interpreted cautiously and as suggestive of the way in which people think about the issues raised, rather than being truly representative.

The majority of people in Nevada live within the Las Vegas Standard Metropolitan Statistical Area. In 1975, Clark County had a population of 374,000 which was roughly 63 percent of the total Nevada state population. From 1970 to 1977, the average annual growth rate in Clark County was 4 percent, well above both the Nevada mean and other counties' average annual growth rate (Table 3.4.2.1-1). Clark County's population density of 45.7 persons per square mile, compared to the Nevada mean of 5.8, illustrates how atypical Clark County is in regard to population distribution and density. Clark County has the lowest percentage of owner-occupied dwelling units in Nevada, and the highest median home values.

Nevada citizens as a whole define their lifestyle values as centering on open space, climate, and relaxed lifestyles (Table 3.4.2.1-2). These values are endorsed as "what people like best about living in Nevada." Residents of Las Vegas are different, except in emphasis. Respondents from Clark County, (primarily Las Vegas), with its sunbelt location and lower elevation, rate climate as the highest ranked value with open space of secondary importance. When questioned about acceptable changes that could occur in their way of life, Clark County residents implied they would be willing to use public transit more (81 percent), 55 percent would accept increased population growth, while 45 percent would accept deterioration in air quality, water availability, reduced public services, increased traffic congestion, increased federal regulation, and reduced access to out-of-doors were deemed not acceptable by the majority of those surveyed.

Clark County respondents surveyed indicated the three most important problems in their area: 21 percent mentioned transportation (facility and circulation) problems, 15 percent said crime and police were major problems, and 10 percent felt concerned about environmental issues (Table 3.4.2.1-4).

Quality of life statistics on crime, public safety and social stress show some paradoxes about Clark County in particular and Nevada as a whole. Crime rates

Table 3.4.2.1-1. Selected measures of the quality of life, Nevada (Page 1 of 3).

Indicator	United States	Nevada	Clark County (Coyote Spring)	White Pine County (Ely)
Population				
Annual Rate of Growth (1970 1977)	0.9	3.6	4.0	-0.2
Population Density (1977)	61.1	5.8	45.7	.9
Housing				
Percent of Dwelling Units Owner Occupied (1970)	62.9	58.5	58.0	72.8
Percent of Housing Units with More than 1.01 Persons/Room (1970)	8.0	8.3	8.9	12.6
Mobile Homes or Trailer as Percent of Housing Units (1970)	4.5	12.0	11.0	12.1
Median Home Value (1970)	17,130	22,570	23,142	10,497
Economics				
Civilian Labor Force Growth Rate (1970-1977)	2.4	6.4	6.3	-.4
Unemployment Rate (1977)	7.0	8.1	8.1	7.8
Per Capita Income (1977)	7,026	7,980	7,735	9,365
Proportion of Population on Public Assistance (1976)	22.2	15.4	15.5	15.6

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Table 3.4.2.1-1. Selected measures of the quality of life, Nevada (Page 2 of 3).

Indicator	United States	Nevada	Clark County (Coyote Spring)	White County (Ely)
Health				
Physicians/1,000 Population (1976)	1.7	1.3	1.2	0.3
Dentists/1,000 Population (1976)	0.5	0.5	0.4	0.3
Registered Nurses/1,000 Population (1976)	4.5	3.8	3.2	3.1
Hospital Beds/1,000 Population (1975)	6.6	5.4	4.7	4.4
Public Safety				
Police Officers/1,000 Population (1976)	2.8	3.8	3.4	2.8
Firefighters/1,000 Population (1968)	2.0	N/A	N/A	N/A
Violent Crimes/1,000 Population (1976)	4.0	7.4	8.6	4.8
Crimes Against Property/1,000 Population (1976)	45.9	72.3	84.9	34.5
Social Stress				
Divorce Rates/100,000 Population (1975)	4.9	17.9	18.6	11.1

T4842/9-16-81/F

Table 3.4.2.1-1. Selected measures of the quality of life, Nevada (Page 3 of 3).

Indicator	United States	Nevada	Clark County (Coyote Spring)	White County (Ely)
Social Disorganization (continued)				
Suicide Rate/1,000 Population (1976)	12.2	26.7	23.3	60.0
Alcoholism Rate/1,000 Population (1976)	42.0	67.7	46.0	38.3
Education				
Median School Years Completed (1976)	12.5	12.6	12.4	12.1
Pupil/Teacher Ratio (1976)	19.5:1 (1978)	23.2:1	25.0	22.2

T4842/9-16-81/F

Sources: Architects and Planners Alliance, Inc., 1979; Bureau of Economic and Business Research, 1979; De Chiasa, J. and L. Koppelman, 1975; Four Corners Regional Commission, 1979; Golden, J. et al., 1979; Nevada Department of Education, 1979; Nevada Office of Health Planning and Resources, 1977; Nevada Office of Planning Coordination, 1978; U.S. Department of Commerce, 1978 and 1979; U.S. Department of Commerce, Bureau of the Census, 1973 and 1978; U.S. Department of Justice, 1977.

Table 3.4.2.1-2. Survey respondents' particular likes about living in Nevada (percentage response).

Attribute	Nevada	County				
		Clark	Eureka	Lincoln	Nye	White Pine
Open Space/ Sparse Population/ Peace and Quiet/ Uncongested	25	16	49	32	36	41
Relaxed Lifestyle/ Freedom/ Individuality	12	10	7	12	16	15
Clean Air/ Lack of Pollution	9	5	20	13	13	10
Climate	16	28	0	7	6	1
Friendly People	5	3	0	12	4	9
Tax Structure/ Low Taxes	6	9	6	6	6	9
Scenery/ Beauty of Area	5	4	2	7	1	7
Recreation	9	9	6	1	6	3
Other	13	15	11	9	15	6

T4861/9-17-81/F

Source: The Governor's Commission on the Future of Nevada, Public Opinion Survey, 1980. Summary Tables, pp. 8-9.

Table 3.4.2.1-3. Survey respondents' indication of their nonacceptance of particular lifestyle changes (percentage response).

Attribute	Nevada	County				
		Clark	Eureka	Lincoln	Nye	White Pine
Would not accept deterioration of air quality	88	91	74	79	86	56
Would not accept increased scarcity of water	84	94	78	80	80	84
Would not accept increased federal regulations	79	77	84	89	82	92
Would not accept reduced access to the out-of-doors	88	83	84	75	94	96
Would not accept riding a bus to work	19	19	52	19	17	17
Would not accept increased congestion	78	83	50	54	65	43
Would not accept increased population	49	45	41	32	35	19
Would not accept reduced quality of public services	72	75	62	76	67	69
Would not accept reduced access to fishing and hunting areas	71	61	82	70	68	92

T4862/9-17-81/F

Source: The Governor's Commission on the Future of Nevada, Public Opinion Survey, 1980. Summary Tables, pp. 9-10.

Table 3.4.2.1-4 Survey respondents' concerns about their area (percentage response).

Concern	Nevada	County				
		Clark	Eureka	Lincoln	Nye	White Pine
Too Rapid/ Unregulated Growth/ Overpopulation	11	9	3	5	5	3
Water/ Sewer/ Water Supply and Quality/ Sewer Capacity	12	5	7	7	11	1
Government (State and Local) Lack of Responsiveness/ Non-representation	4	3	6	6	5	7
Roads/ Transportation/ Traffic	14	21	4	6	8	5
Housing/ Cost of/ Lack of/ Quality	5	3	5	6	11	5
Lack of Planning/ Zoning	3	3	1	2	2	0
Crime/ Police	9	15	12	0	2	1
Education/ Crowded Schools/ Quality of Education/ Lack of Facilities	3	2	6	7	6	3
Environmental Concerns/ Destruction/ Loss of Scenery/ Pollution/ General	8	12	1	1	4	2
Federal Government Regulation/ Bureau of Land Management/ U.S. Forest Service, etc.	3	1	11	12	6	17
Unemployment/ Economic Depression	3	2	2	9	1	21
Energy/ Cost/ Electricity/ Power Plants/ Fuels	4	4	4	3	1	3
Public Services/ Fire Services/ Community Programs/ Other	2	2	1	6	7	1
Economic Diversification/ Lack of Industry	3	2	5	4	4	9
Health/ Medical/ Emergency Services	2	1	5	6	2	0
Recreation	2	2	5	3	5	1
Other	13	13	22	11	16	14

T4863/9-17-81/F

Source: The Governor's Commission on the Future of Nevada, Public Opinion Survey, 1980. Summary Tables, pp. 7-8.

somewhat higher in Clark County than in Nevada as a whole, which one would expect for an urban area. But Clark County has proportionately fewer police officers-- 3.4/1,000 population, in comparison to the Nevada average of 3.8/1,000.

Similar paradoxes are apparent in social stress indicators. The Clark County suicide rate of 23.3/100,000 population is almost twice the national rate but somewhat less than the state rate. Yet the Clark County alcoholism rate of 46/1,000 population is similar to the national average, and considerably lower than the state average.

Economic indicators such as the unemployment rate and the civilian labor force growth rate of 1977 are both higher than the national and other study area means, but consistent with the state mean rate. In Clark County, the labor force had grown 6.3 percent per year from 1970-1977. The unemployment rate also is high because of continuous in-migration of people looking for work. The per capita income level in 1977 of \$7,735 was also much higher than many rural areas, but lower than the state mean of \$7,980.

Several questions were asked in the Governor's Commission Survey concerning desires for future economic growth (Tables 3.4.2.1-5 and 3.4.2.1-6). About three-fourths of the persons returning surveys from Clark County felt it was of major importance to develop employment areas other than gaming (Table 3.4.2.1-6). However, over 50 percent of the respondents did not feel growth (more people) would be beneficial to the community (Table 3.4.2.1-5). Nearly 50 percent of the persons said they were not pleased with the growth that had occurred in the last four years. When asked what three areas they would prefer to see expanded in the next few years, people indicated recreation, agriculture, and gaming were most important and should be expanded (Table 3.4.2.1-6). Presently, the major employment areas are retail trade, services, construction, transportation, and public utilities.

Regarding politics, residents felt their interests and ideas were not being represented by government officials. They wanted to see more state regulation in the next 20 years concerning conservation of agricultural lands, energy conservation, environmental protection, public utility regulations, and wildlife management (Governor's Commission, 1980: 15-16).

When questioned about public services and the amount of public taxes that should be spent on these various services, people felt greater money should go to police protection, transportation, land use planning, health services, services to senior citizens, parks and recreation, and colleges and universities. Sixty percent of those surveyed felt the present health services were adequate (Governor's Commission, 1980). The quality of life indicators for public health services indicate there were 1.2 physicians/1,000 population, 0.4 dentists/1,000 population, 3.2 registered nurses/1,000 population, and 4.7 hospital beds/1,000 population. These levels, although above other study area figures, are slightly below the state mean levels of 1.3 physicians, 0.5 dentists, 3.8 nurses, and 5.4 hospital beds per 1,000 population, respectively.

In response to questions dealing with the perceived adequacy of the educational institutions in Clark County, fully half the persons felt that the school districts in their area were not preparing students adequately for the future. There

Table 3.4.2.1-5. Survey respondents' attitudes toward growth and development (percentage response).

Question	Answer	County				
		Nevada	Clark	Eureka	Lincoln	Nye
1. Is growth (more people) beneficial to your community?	Yes	41	41	41	70	51
	No	54	51	39	27	45
	No Opinion	5	8	20	3	4
2. Would you like the area in which you live to grow?	Not at all	22	18	16	15	21
	Slowly	38	38	38	26	38
	Moderately	37	41	38	56	34
	Rapidly	3	3	7	3	8
	No Opinion	0	1	2	0	0
3. Are you pleased with the growth (or lack of growth) in your community in the last few years?	Yes	33	44	48	51	44
	No	60	47	39	42	46
	No Opinion	7	9	13	7	10

White
Pine

86
13
1

10
18
71
1
0

20
73
7

T4865/9-17-81/F

Source: The Governor's Commission on the Future of Nevada, Public Opinion Survey, 1980. Summary Tables, p. 7.

Table 3.4.2.1-6. Survey respondents' preferences for types of economic activity that could expand in Nevada (percentage response).

Economic Activity	Nevada	County				
		Clark	Eureka	Lincoln	Nye	White Pine
Gaming	11	26	6	4	8	6
Recreation	20	18	21	7	12	5
Agriculture	26	17	57	34	39	20
Mining	9	5	9	20	12	25
Warehousing	5	7	0	1	4	4
Light Manufacturing	14	3	4	11	8	4
Heavy Manufacturing	2	0	2	1	6	0
Major Energy Facilities	9	9	0	6	4	31
Federal Government Research	1	2	0	0	2	1
Federal Defense Projects	4	5	0	16	6	4

T4864/9-17-81/F

Source: The Governor's Commission on the Future of Nevada, Public Opinion Survey, 1980. Summary Tables, pp. 2-5.

was a higher level of satisfaction expressed regarding the college and university programs (Governor's Commission, 1980:). The median number of school years completed in Clark County was 12.4 years, slightly below the Nevada mean of 12.6 years. The pupil/teacher ratio was 25.0, somewhat higher than other study area ratios.

In summary, the urban center of Las Vegas makes Clark County unique among the other Nevada counties in the deployment area, the latter being quite rural. Clark County, with its large population and active economy, faces problems that are generally not present in small town communities, and therefore presents a very different set of conditions to be evaluated in a study of potential M-X operating bases.

Natural Environment (3.4.2.2)

The following sections describe existing characteristics of the natural environment of the Coyote Spring Operating Base Vicinity. Topics covered include Water Resources, Erosion, Air Quality, and Biological Resources.

Water Resources (3.4.2.2.1)

General Hydrology

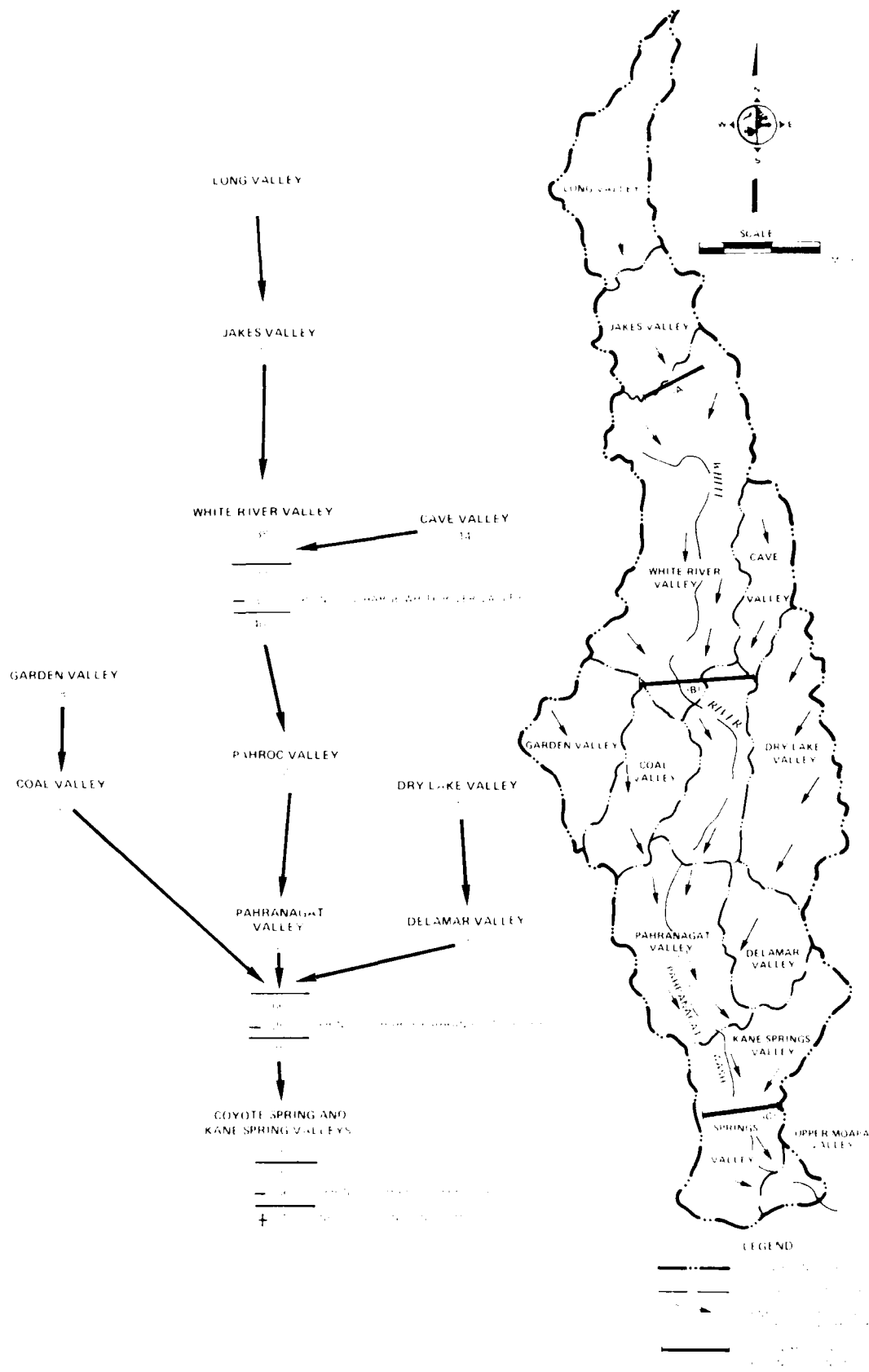
The main body of groundwater occurring in the valleyfill is probably at depths of 270 ft or more. However, around Coyote Spring, some "perched " groundwater exists at shallower depths. The regional carbonate aquifer that is part of the White River system (see Figure 3.4.2.2-1) lies beneath the valleyfill groundwater system.

Water Availability

The combined perennial yield of groundwater in Coyote Spring and Kane Springs valleys is estimated to be on the order of 2,600 acre-ft (Eakin, 1964), equivalent to the estimated average annual recharge derived from precipitation within the area. The State Engineer's Office estimated (in 1971) a perennial yield of 18,000 acre-ft for Coyote Spring Valley, with less than 500 acre-ft for Kane Springs Valley. The substantial difference between the perennial yield estimates by Eakin (1964) and the State Engineer's Office is due to the consideration of inter-basin underflow of groundwater in the Coyote Spring hydrological basin.

Coyote Spring and Kane Springs valleys are used principally for livestock range, and water use is minor. Substantial local development of groundwater for irrigated agriculture, power plant cooling, and municipal uses, is concentrated in the adjacent area of Muddy River Springs to the southeast of Coyote Spring Valley. In addition to groundwater use, the majority of local spring discharge (37,000 AFY) is also used.

The siting area is characterized by two major axial drainages, White River (Pahranaagat Wash) and Kane Springs Wash. These axial washes are flanked by numerous tributaries which partially transect the valleyfill sediments. Kane Springs Wash drains southwesterly and joins White River just east of U.S. Highway 93. White River drains south to the vicinity of State Route 7 where it turns southeast and exits Coyote Spring Valley between the Arrow Canyon Range and the Meadow



Valley Mountains. It eventually joins the Muddy River to the south. Water in both the White River Channel and Kane Springs Wash is ephemeral and flows only after periods of heavy rainfall.

The primary surfacewater supply is from spring discharge southeast of Coyote Spring Valley in the Muddy River Springs area. These springs are considered the outlet for the White River regional groundwater flow system that originates from the north, and includes the underflow from 13 valleys.

A more detailed presentation of the hydrology of the Coyote Springs area is found in ETR-12.

Erosion (3.4.2.2.2)

The soils of the Coyote Spring Valley OB area have formed primarily on piedmont slopes with 2 to 15 percent slopes. Gravel covers much of the area's surface and protects underlying material from wind erosion. However, highly wind-erodible, sandy soils also occur in the area. The water erosion hazard for soils in this area is moderate due to the moderate to steep slopes.

Air Quality (3.4.2.2.3)

Dispersion is primarily a function of local winds, mixing heights, and topography. A summary of some climatological parameters relevant to air quality appear in Table 3.4.1.2-1.

Particulate emissions for the Coyote Spring area are 115,587 tons per year from all sources, including windblown fugitive dust (Table 3.4.1.2-1). The baseline gaseous emissions levels are also shown in Table 3.4.1.2-2.

Ambient air quality data collected at the nearby (20 km southeast) Reid Gardner Power Plant in 1978 indicate 24-hour average NO_2 and SO_2 levels of less than 30 $\mu\text{g}/\text{cu m}$, which are considerably below the standards for these pollutants. Ozone concentrations occasionally approach the federal standard (0.12 ppm, 1-hr. average), but did not exceed it during the period of measurement. TSP levels at two sites near Reid Gardner varied from 10 to 120 $\mu\text{g}/\text{cu m}$ for a 24-hour average. The annual geometric mean TSP concentration at the two sites was 34 $\mu\text{g}/\text{cu m}$ and 53 $\mu\text{g}/\text{cu m}$.

Biological Resources (3.4.2.2.4)

Vegetation and Soils

Figure 3.4.2.2.4-1 shows major vegetation types in the area. They are creosote bush scrub, Joshua Tree woodland, desert marsh and spring vegetation, wash and arroyo vegetation, and, above 6,000 ft, pinyon-juniper woodland.

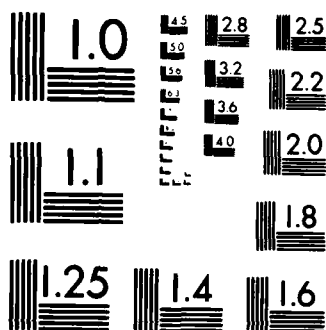
The vegetation of Coyote Spring Valley is dominated by typical creosote bush scrub (Mojave desert scrub), consisting of shrubs 2 to 10 ft tall, widely spaced. The dominant species are bursage (Ambrosia dumosa), creosote bush (Larrea divaricata), Nevada ephedra (Ephedra nevadensis), Mojave yucca (Yucca schidigera), and spiny menodora (Menodora spinescens). Creosote brush scrub occurs over the entire valley

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floor and up to 4,000 ft elevation. Areas with Joshua trees (Yucca brevifolia) with an understory of creosote bush are also found in the southern portion of Coyote Spring Valley.

Near where Kane Springs Wash joins the main drainage in Coyote Springs, in the center of the valley, there is an area of pale-colored lakebottom sedimentary deposits, with marsh vegetation characteristic of periodically moist alkaline soils. The following species predominate: lens-scale (Atriplex lentiformis), shadscale (Atriplex confertifolia), mesquite, (Prosopis glandulosa), and tamarisk (Tamarix spp.). Understory plants include saltgrass (Distichlis spicata), sand dropseed (Sporobolus cryptandrus), and seep-weed (Suaeda torreyana).

Coyote Spring Valley also contains numerous washes and arroyos which are dominated by desert willow (Chilopsis linearis), punctate rabbitbrush (Chrysothamnus paniculatus), desert encelia (Encelia virginensis), and bursage (Ambrosia dumosa). The main north/south drainage in the valley crosses the proposed operating base site and contains this vegetation. Scattered pinyon-juniper woodland, dominated by Utah juniper (Juniperus osteosperma) and single-leaved pinyon (Pinus monophylla), occurs on the mountain slopes above 6,000 ft.

Adjacent Kane Springs Valley is transitional between the Mojave Desert (hot desert) and Great Basin (cold desert) floristic provinces, with greater affinity to the Mojave Desert in vegetation characteristics. The watershed is dry and lacks significant wetland habitats. The topography is dominated by branches of Kane Springs Wash that flow south through the valley and eventually enter Coyote Spring Valley. The following vegetation types occur in Kane Springs Valley: Mojave desert scrub, desert wash and arroyo vegetation, shadscale scrub, and Great Basin sagebrush. Above 4,500 ft, there are areas of pinyon-juniper woodland and montane brush.

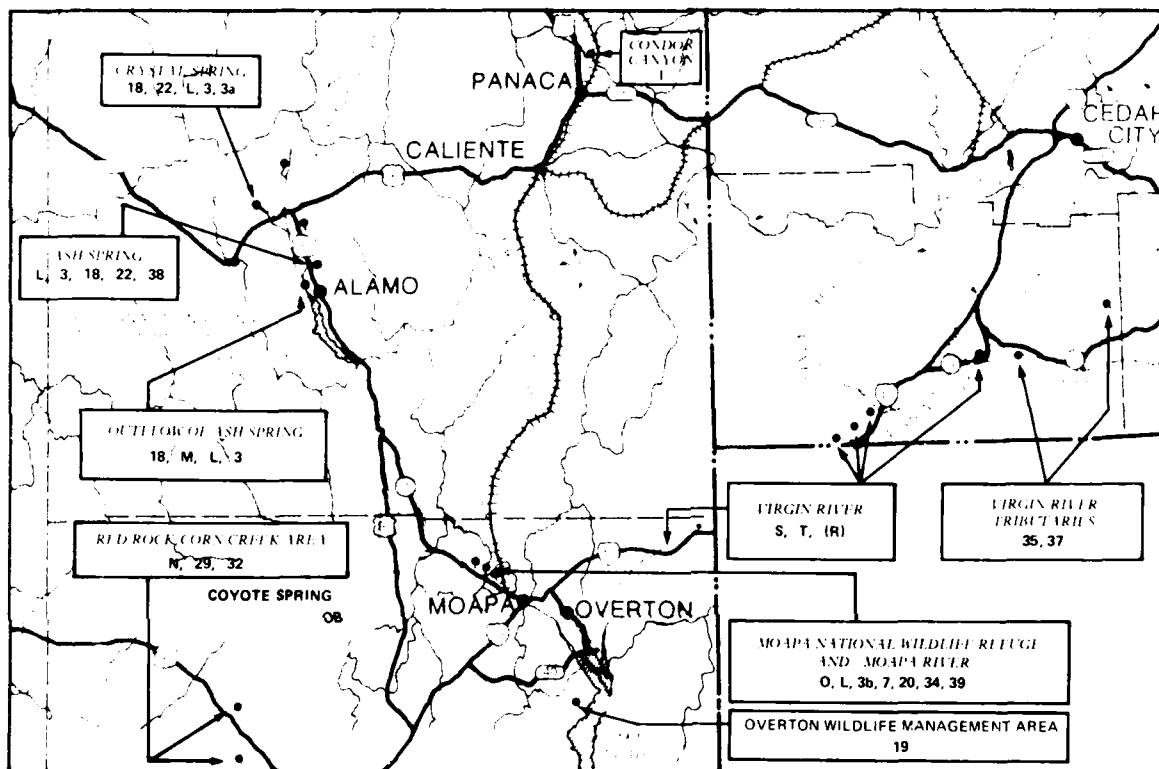
The soils of Coyote Spring Valley are those found primarily on terraces and alluvial fans. In general, the soils are shallow to moderately deep and on slopes of 2 to 15 percent. In the valley bottom and floodplains of Coyote Spring Valley are moderately deep to very deep loamy or clayey soils with slopes ranging from 0 to 8 percent.

Aquatic Species

Recreational fishing opportunities are available to the north, east, and south of the potential OB location in Coyote Spring Valley. Upper Pahrnagat Reservoir, located 50-60 mi north of the potential OB location, contains a warm-water fishery for green sunfish, bluegill, and catfish.

Protected Aquatic Species

Of all the potential OB sites, the Coyote Spring siting area lies nearest to critically sensitive aquatic habitats. Within 1-2 mi downslope of the suitability zone of this potential OB site is the Moapa National Wildlife Refuge, containing two protected fish, one recommended protected fish, and three recommended protected invertebrates (Figure 3.4.2.2.4-2). The Moapa dace is federally protected as endangered, and the Moapa White River springfish is state protected as threatened. In addition, the Moapa speckled dace and three invertebrates (the Moapa Valley



LEGEND

PROTECTED FISH SPECIES FOR NEVADA AND UTAH

- 1 BIG SPRING SPINEDACE
- L WHITE RIVER SPRINGFISH
- M PAHRANAGAT ROUNDTAIL CHUB*
- N PAHRUMP KILLIFISH*
- O MOAPA DACE*
- S VIRGIN RIVER ROUNDTAIL CHUB
- T WOUNDFIN*

RECOMMENDED PROTECTED FISH SPECIES FOR NEVADA

- 3 WHITE RIVER SPRINGFISH
- 3a HIKO WHITE RIVER SPRINGFISH
- 3b MOAPA WHITE RIVER SPRINGFISH
- 7 MOAPA SPECKLED DACE
- (R) VIRGIN SPINEDACE
- 18 WHITE RIVER SPECKLED DACE

RECOMMENDED PROTECTED INVERTEBRATES MOLLUSKS

- 20 MOAPA VALLEY TURBAN
- 22 PAHRANAGAT VALLEY TURBAN
- 29 RED ROCK FONTELLICELLA
- 32 CORN CREEK SNAIL
- 34 MOAPA TRYONIA
- 35 ZION CANYON PHYSA

INSECTS

- DIPTERANS
- 37 VIRGIN RIVER NET WINGED MIDGE
- HEMIPTERANS
- 38 ASH SPRINGS CREEPING WATER BUG
- 39 MOAPA CREEPING WATER BUG

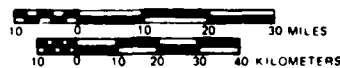
* FEDERALLY PROTECTED

STREAM OR CREEK

SPRING

OPEN WATER

LEGEND



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Figure 3.4.2.2.4-2. Federal, state, and recommended aquatic species, Coyote Spring Valley.

turban snail, Moapa tryonia snail, and Moapa creeping water bug), which are recommended for protection, also inhabit the sanctuary. The Pahrnagat Valley, just north of this siting area, contains habitat for several protected aquatic species, including the Pahrnagat roundtail chub (federally protected as endangered).

Rare Plants

Three critically endangered (Nevada Division of Forestry under NRS 527.270) rare plant species are reported to occur in this vicinity. They are: the Steno sandwort (Arenaria stenomeris), the triangle geyer milkvetch (Astragalus geyeri var. triquetrus), and the Nye milkvetch (Astragalus nyensis). Federal candidate rare plant species reported from the vicinity include those listed above and, in addition, the pigmy Agave (Agave utahensis var. eborispina), Merriam bear-poppy (Arctomecon merriamii), fragrant ash (Fraxinus cuspidata var. macropetala), and large-headed rock daisy, (Perityle megalcephala var. intricata). Refer to Appendices A-1 and A-3 of ETR-17, Protected Species, for specific habitat information. A Tier IIA field study will identify potential habitat within the region of influence.

Protected Species

The state protected desert tortoise occurs in the Coyote Spring Wash area, mostly on the slopes and washes, but it can be found in any lowland habitat type. The proposed OB site contains some of the greatest concentrations of desert tortoises in Coyote Spring Wash. Bald eagles (federally protected) winter a short distance north in the Pahrnagat Valley at the Pahrnagat National Wildlife Refuge and Key Pitman Wildlife Management Area. The state protected gila monster may occur in this valley.

Wilderness/Natural Areas

Wilderness resources within a 100 air-mile radius of the potential Coyote Spring OB site are listed in Table 3.4.2.2.4-1. Resources in the immediate vicinity of the Coyote Spring OB are mapped in Figure 3.4.2.2.4-3. The resource conflict with the conceptualized OB suitability zone is discussed in Chapters 2 and 4 of the FEIS and in ETR-18.

Significant natural areas within a 50 air-mile radius of the site are listed in Table 3.4.2.2.4-2. The Desert National Wildlife Refuge virtually abuts the west boundary of the potential site for most of its length. Approximately one-half (more than 6,500 acres) of Arrow Canyon Range is contained within the base suitability zone.

Human Environment (3.4.2.3)

The following sections describe baseline socioeconomic and cultural characteristics of the Coyote Spring Operating Base Vicinity Environment. Included are: Employment, Income and Earnings, Public Finance, Population, Housing, Community Infrastructure, Traffic and Transportation, Energy, Land Ownership, Land Use, Native Americans, and Archaeological/Historical Resources.

Table 3.4.2.2.4-1. Wilderness resources within a 100 air-mile (160.9 Km) radius of the potential Coyote Spring OB site¹.

State	Wilderness Resources	
	Approximate Miles From OB Site	Approximate Km From OB Site
Nevada		
Fish and Wildlife No. 1	2	3
Meadow Valley Mountains	3	5
Desert National Wildlife Range	3	5
Delamar Mountains	6	10
Evergreen (C)	8	13
Arrow Canyon Range	9	15
Evergreen (B)	11	18
Fish and Wildlife No. 2	11	18
Evergreen (A)	12	19
Mormon Mountains	15	24
Fish and Wildlife No. 3	21	34
Lower Pahrnagat Lake	22	35
Medsger Pass	24	39
East Pahrnagat	25	40
South Pahrocs/Hiko	34	55
Grapevine Spring	36	58
Muddy Mountains	37	59
Quail Springs	42	68
Nellis	42	68
Lake Mead National Recreation Area	44	71
Lime Canyon	48	77
Mt. Stirling	58	93
Million Hills	62	100
Tunnel Spring	62	100
Weepah Spring	65	105
Worthington Mountains	69	111
Parsnip Peak	79	127
Quinn	86	138
Grant Range (USFS)	91	146
White Rock Range	96	155
Grant Range (BLM)	100	161
Utah		
Starvation Point	60	91
Tunnel Spring	62	100
Red Mountain	68	109
Cottonwood Canyon	80	129
Pine Valley Mountain	82	132
White Rock Range	96	155

T5050/9-18-81

¹ Wilderness resource areas outside the states of Nevada and Utah were not included in this evaluation.

Table 3.4.2.2.4-2. Significant natural areas within a 50 air-mile (80 Km) radius of the potential Coyote Spring OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	Km
Nevada		
Arrow Canyon Range	0	0
Desert National Wildlife Range	5	10
Pinyon-Juniper Research Natural Area	10	15
Meadow Valley Mountains	10	15
Deadhorse Research Natural Area	15	25
Moapa Valley National Wildlife Refuge	15	25
Basin Research Natural Area	20	30
Hayford Peak Research Natural Area	20	30
Weiser Bowl	25	40
Mormon Peak	25	40
Delamar	25	40
Pahranagat National Wildlife Refuge	30	50
Valley of Fire National Natural Landmark	30	50
Overton Wildlife Management Area	35	55
Virgin River	35	55
Gold Butte	45	70
Virgin Mountain Research Natural Area	50	80
Devil's Throat	50	80
Papoose Lake Research Natural Area	50	80
Key-Pittman Wildlife Management Area	50	80
Utah		
None		

T5078/9-19-81

Employment and Labor Force (3.4.2.3.1)

The Coyote Spring OB option is located in the southern part of the Nevada/Utah region of influence (ROI). The specific area of analysis (AOA) includes Clark and Lincoln counties in southeastern Nevada. The discussion of employment and labor force for Lincoln County appears in Section 3.4.1.3.1 of this chapter. A detailed analysis of the employment and labor force in the AOA is presented in Section 2.1.3.2 of ETR-44. For the Proposed Action, the Coyote Spring OB would be located in Coyote Spring Valley 52 miles north of Las Vegas, along U.S. Highway 93. This OB would also be used as the first base in Alternatives 1, 2, and 8 and the second base in Alternatives 4 and 6. Other alternative OB sites include Ely, Nevada; Milford, Delta and Beryl, Utah; Clovis, New Mexico; and Dalhart, Texas.

Recent Labor Force Trends

Clark County

Over 99 percent of the county's population is employed in the Las Vegas area of Clark County. The major employment sectors, in descending order of importance are: services (including the gaming industry), trade, government, construction, and transportation and public utilities.

The size of the labor force in Clark County has more than doubled over the past 13 years from 101,300 persons in 1968 to 208,000 in 1980. Employment levels have also more than doubled since 1968 and show the same steady growth pattern as the labor force. In 1980, 193,200 of the persons living in Clark County were employed.

The number of unemployed workers tripled between 1968 and 1975 as the unemployment rate rose from 5.2 to 10.6. Unemployment decreased in the next 3 years, but resumed the upward trend again in 1979 and 1980. The number of unemployed workers living in the county in 1980 was 14,800, 7.1 percent of the Clark County labor force.

Lincoln County

Lincoln County recent labor force trends are discussed in Section 3.4.1.3.1.

Projected Employment

Employment projections for Clark County are presented in Section 3.2.3.1.2.1. In addition, trend-growth projects for the construction, trade, and service sectors are presented in Table 3.4.2.3.1-1 for Clark County. Trend-growth projections for Lincoln County appear in Table 3.4.1.3.1-2 in Beryl section.

Income and Earnings (3.4.2.3.2)

Location of an operating base in Coyote Spring would have the most effect on Clark County and Lincoln County. Detailed baseline earnings data by major industrial sector can be found in ETRs 2C and 2G.

Table 3.4.2.3.1-1.

Projected trend-growth
employment in construction,
trade, and services
in Clark County, 1982-
94 (number of jobs).

Year	Clark County		
	Construction	Trade	Services
1982	16,216	47,048	97,818
1983	16,900	48,874	101,607
1984	17,632	50,834	105,628
1985	18,393	52,893	109,833
1986	18,919	54,252	112,914
1987	19,432	55,590	116,022
1988	19,970	56,991	119,222
1989	20,522	58,402	122,504
1990	21,081	59,844	125,876
1991	21,658	61,283	129,257
1992	22,240	62,765	135,172
1993	22,832	64,231	136,265
1994	23,430	65,705	139,868

T5529/9-23-81/F

Source: University of Utah, Bureau of Economic
and Business Research 1980.

Note: Projections are presented to nearest
job only for convenience in review,
and do not imply this level of accuracy.
Only trend-growth projections are
presented for Clark County since high-
growth projections are not significantly
greater.

Clark County

Total labor and proprietor's income by place of work amounted to approximately \$3.3 billion in 1979, accounting for about 54 percent of all the labor and proprietor income generated in the state as a whole. Much of this income was generated by the relatively strong tourist industry. As a result, personal income per capita in the county is quite high - \$10,300 in 1979 compared to the U.S. average of \$8,800 (Section 3.2.3.2).

Total wage and salary earnings per worker in 1979 amounted to approximately \$13,361 in 1979, higher than both Nevada and United States averages.

Lincoln County

Recent trends in income and earnings in Lincoln County have been discussed in Sections 3.2.3.2 and 3.4.1.3.2.

Public Finance (3.4.2.3.3)

Coyote Spring

Historical fiscal data, including revenue (by source), expenditures (by category), growth rates, and school district data are presented for Clark County, and the municipalities of Las Vegas, North Las Vegas, Henderson, and Boulder City as a measure of these governments' ability to absorb growth. Fiscal data for Lincoln County and Caliente can be found in Section 3.4.1.3.3. Revenue and expenditure data for Lincoln County, are located in Table 3.4.1.3.3-1, school districts, in Table 3.4.1.3.3-2, and assessed evaluation, indebtedness limitations, and revenue bonding capacities in Table 3.4.1.3.3-3.

In Clark County, the revenue structure is well balanced. Property tax revenues account for general fund revenue shares ranging from a low of 13.6 percent in North Las Vegas to a high of 25.1 percent in Clark County (see Table 3.4.2.3.3-1 and ETR-2C). The principal difference in the fiscal structures between the county and the cities, is that the cities, except for Las Vegas, depend more heavily on intergovernmental revenues. These range from a 44.6 percent share for general fund revenues in Boulder City to 53.8 percent in North Las Vegas. In Clark County, intergovernmental revenues account for 11.5 percent of general fund revenues, and in Las Vegas 23.2 percent. This unique structure in both Clark County and Las Vegas exists because the gaming industry, with its related taxes, licenses and permits, is a major source of revenue in these jurisdictions.

Public safety is the largest expenditure category in the county and in the cities, ranging from 26.2 percent in Clark County to 56.0 percent in the more heavily policed Las Vegas. Table 3.4.2.3.3-1 presents growth rates and percentage shares for selected revenue and expenditure categories for Clark County, North Las Vegas, Las Vegas, Henderson, and Boulder City. All these jurisdictions have maintained total revenue growth rates of 15-20 percent and expenditure growth rates of 12-15 percent, except for North Las Vegas. In North Las Vegas, revenues have grown at a rate of 10.8 percent, and expenditures at a rate of 6.1 percent.

Beginning in fiscal year 1981-82, the 1981 Tax Reform Plan (Assembly Bill 369 and Senate Bill 69) will produce marked changes in local revenue structures. The

Table 3.4.2.3.3-1 Growth rates and percent of total revenues/expenditures for selected categories, county and municipal governments in Clark County, FY 1974-1975 to FY 1979-1980.

County/City	Total Revenues			Property Tax Revenues			Intergovernmental Transfers			Total Expenditures		Public Safety Expenditures	
	Annual Rate	Annual Rate	Percent of Total Revenues	Annual Rate	Annual Rate	Percent of Total Revenues	Annual Rate	Annual Rate	Percent of Total Revenues	Annual Rate ¹	Annual Rate	Annual Rate	Percent of Total Expenditures
Clark	16.2	18.4	25.1	14.9	11.5	14.7	16.7	26.2					
North Las Vegas (Clark)	10.8	9.6	13.6	11.6	53.8	6.1	6.1	53.4					
Las Vegas ² (Clark)	15.3	20.4	19.4	5.8	23.2	15.3	13.8	56.0					
Henderson (Clark)	14.5	19.0 ³	16.6 ³	12.3	50.7	13.4	15.5	43.2					
Boulder ² (Clark)	14.7	15.3	20.3	13.1	44.6	12.5	14.1	30.0					

T 546 3/9-2 3-81/E

¹ Annual Compound rate of change.

² FY 1974-1975 to FY 1978-1979.

³ FY 1975-1976 to 1979-1980.

Table 3.4.2.3.3-2. Growth rates and percent of total revenues/expenditures for selected categories, FY 1974-1975 to FY 1978-1979.

Clark and Lincoln County School Districts										
	Total Revenue		State Revenues		Local Revenues		Total Expenditures		Instruction Expenditures	
	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Expenditures	Annual Rate	Percent of Total Expenditures
Clark County School District	13.6		12.4	33.2	13.0	58.4	14.7		11.0	51.5
Lincoln County School District	13.6		12.5	55.3	20.1	26.7	13.4		12.3	53.6

T5444/9-3-81

† Annual compound rate of change.

Source: EIRs 2C and 2G.

Table 3.4.2.3.3-3. Assessed valuation, indebtedness limitations, and reserve bonding capacities, 1980.

Jurisdiction	Assessed Value	Indebted- Ness Limitation	Outstanding G.O. Bonds	Reserve Bonding Capacity	Debt Tax Rate 1980-81	Year of Final Payment
Clark County	3,481,036,558	348,103,656	14,888,000	333,215,656	0.1562	1999
Clark County School District	3,481,036,558	522,155,484	131,951,000	390,204,484	0.7018	1993
North Las Vegas	146,698,481	44,009,544	6,055,000	37,954,544	0.5228	1990
Las Vegas	1,218,400,377	365,520,113	3,790,000	361,730,113	0.0857	1986
Henderson	107,810,476	32,343,143	4,709,000	27,634,143	0.1314	2002
Boulder City	47,713,609	14,314,083	510,000	13,804,083	0	2000
Moapa Valley Fire Protection District	13,955,405	697,770	0	697,770	0	0
Southwest Fire Protection District	197,355,585	9,867,779	0	9,867,779	0	0

T5445/9-23-81/F

¹ Per \$100 Assessed Value.

Source: Nevada Department of Taxation, 1981, Local Government Green Book, Statewide Indebtedness Report of Nevada Local Governments.

plan would increase the total retail sales tax from 3.5 percent to 5.75 percent and concurrently decrease the taxable value of all land, homes, buildings, and other improvements. Cities and counties would share sales tax revenues through the City/County Relief Tax, which, under Assembly Bill 369 would raise sales tax rates from 0.5 percent to 2.25 percent of taxable retail sales. Senate Bill 69 will reform property taxes so that homes will be assessed and taxed in the same way as commercial and industrial properties. Houses, buildings, and other improvements will be assessed by determining replacement cost less depreciation, with obsolescence also considered. A 35 percent assessment is then applied to the adjusted cash value to compute assessed valuation. Assembly Bill 369 and Senate Bill 69 reduce property tax burdens on homeowners, while offsetting the lost revenue with increased sales tax revenue. Consequently, the percentage shares of revenue sources will be drastically altered in the future.

School district revenues and expenditures follow similar patterns throughout the state of Nevada. Instruction is the largest single expenditure, at 51.5 percent in Clark County school district. Revenue for the school districts is principally from state and local contributions. In Clark County school district, state revenues account for 38.2 percent of total revenues and local contributions for 58.4 percent. Growth rates followed similar trends during the fiscal years 1974-75 through 1978-79 (see Table 3.4.2.3.3-2).

State Senate Bill 204, an across-the-board property tax relief package was introduced in 1979-80. The county maximum tax rate was reduced from \$5 per \$100 of assessed valuation to \$3.64. One dollar of this decrease consisted of the school mandatory tax levy and the school optional tax levy. Also, food items were declared exempt from taxation. The tax relief package provides for the state to make up any revenues lost by property and sales tax relief through the Distributive School Fund. Thus, in the last fiscal year, state contributions to education have risen dramatically from the baseline data presented. State revenues are expected to account for 60-70 percent of school district revenues, and local contributions to decrease accordingly. The 1981 Tax Reform Plan would lower property tax revenues for education even more. An increase in the local School Support Tax from 1 percent to 1.5 percent is expected to counter the loss in property tax revenue. This would maintain state and local contributions to education at approximately the same level as under the 1979 tax relief package.

Assessed valuations, indebtedness limitations, and reserve bonding capacities for selected jurisdictions are presented in Table 3.4.2.3.3-3. Clark County, Las Vegas, North Las Vegas, Henderson, and Boulder City have large and stable enough tax bases that they would be able to absorb relatively rapid growth. Because of the 1979 Tax Relief Plan and the 1981 Tax Reform Plan, any major capital expenditure programs financed through general obligation bonds payable from property taxes would not be feasible.

Population and Communities (3.4.2.3.4)

The area of analysis (AOA) for the proposed OB at Coyote Spring Valley, a remote rural area in northern Clark County, includes Clark County and the Alamo portion of adjacent Lincoln County. The extent of the AOA is determined by the maximum daily commuting zone for direct project workers who would have employment locations on the OB. The two counties grew rapidly during the last

decade, with increases of 69 percent in Clark and 46 percent in Lincoln County (see Table 3.4.2.3.4-1).

Clark County

Clark County population, which includes the Las Vegas urban area, increased by 188,500 persons over the last decade to a population of 461,816 in 1980. This increase represents an annual growth rate of 5.4 percent, making the Las Vegas metropolitan area one of the fastest growing in the nation. The city of Las Vegas itself, with 164,674 residents, comprised about 36 percent of the county's population. The communities in northern Clark, in the Moapa Valley and along the Highway 15 corridor, have small populations, varying from 492 in Bunkerville township to 1,752 in Overton. Clark County has the largest concentration of ethnic and racial minority groups of any county in the ROI, with blacks comprising 10 percent, Native Americans 6.6 percent, and persons of Spanish origin 7.6 percent of the county's residents. In 1970, Clark County had 9.1 percent of its total populations composed of blacks, however, almost 85 percent of these 30,000 people resided in the urban centers of Las Vegas and North Las Vegas. The average household size in the county, 2.63 persons per household, is lower than the national average of 2.75, although slightly larger than that of the state of Nevada.

Lincoln County

Lincoln, a sparsely settled county just north of the proposed OB site at Coyote Spring Valley, had 3,732 residents in 1980, an increase of 1,175 persons or 46 percent since 1970. Alamo township, which is the area of the county most likely to receive impacts from an OB at Coyote Spring, was the most rapidly growing portion of the county. The number of residents in Alamo township almost tripled during the decade, increasing from 398 in 1970 to 1,126 in 1980.

Housing (3.4.2.3.5)

Clark County has shown remarkable growth over the past thirty years. Housing units increased from 16,298 in 1950 to 190,223 in 1980. This represents an average annual growth rate in excess of 7 percent for the period 1950-1980 (Clark County Department of Comprehensive Planning, 1980).

Of the total housing stock in the county, 35 percent is located in the city of Las Vegas, and 7 percent in the community of North Las Vegas. The 1979 composition of dwelling units in the city of Las Vegas was 58 percent single family homes, 21 percent apartments, and 5 percent mobile homes (Clark County Department of Comprehensive Planning, 1980).

The share that single family homes made up of the total county stock decreased between 1970 and 1979 from 56 percent to 51 percent. The proportion in mobile homes remained stable at around 11 percent, and the apartment share increased from 19 percent to just over 22 percent.

The average annual number of housing construction permits issued between 1970 and 1979 was almost 9,000, and of these, between 51 and 69 percent were for single family dwelling units. There has occurred a dramatic reduction in the number of permits issued since the peak in 1978. This reduced construction activity, in

Table 3.4.2.3.4-1. Population and population change 1970-1980 by county and community within the Coyote Spring OB area of analysis.

County/Community	Population		Change 1970-1980		
	1980	1970	Number	Percent	Annual Rate ¹
Clark County, Nevada	461,816	273,288	188,528	69.0	5.4
Bunkerville twp ²	492	244	248	101.6	7.3
Goodsprings twp	1,003	314	689	219.4	12.3
Henderson twp	24,334	16,410	7,924	48.3	4.0
Henderson city ³	34,363	16,395	7,972	48.6	4.0
Las Vegas twp	350,511	191,260	159,251	83.3	6.2
Las Vegas city	164,674	125,787	38,887	30.9	2.7
Logan twp	1,087	426	661	155.2	9.8
Mesquite twp	922	674	248	36.8	3.2
Moapa twp	702	353	349	98.9	7.1
Nelson twp	10,059	5,674	4,367	83.6	6.3
Boulder City city	9,590	5,223	4,367	83.6	6.3
North Las Vegas twp	70,334	56,241	14,093	25.1	2.3
North Las Vegas city ⁴	42,739	36,212	6,527	18.0	1.7
Overton twp	1,752	1,336	416	31.1	2.7
Searchlight twp	620	356	264	74.2	5.7
Lincoln County, Nevada	3,732	2,557	1,175	46.0	3.9
Alamo twp	1,126	398	728	182.9	11.0

T5124/8-12-81

¹ Annual compound rate of change.

² Township

³ Includes 72 persons (1980) in Las Vegas township.

⁴ 1970 census data adjusted to reflect 1980 city boundaries.

Source: U.S. Bureau of the Census, Nevada Final Population and Housing Unit Counts, (PHC80-V-30), March 1981.

conjunction with continued in-migration, has caused the housing vacancy rate to drop. This rate fell from 5.7 percent in 1970 to 3.3 percent in 1980 for all housing types, creating a stock of about 6,300 vacant housing units. As of 1975, the vacancy rate for communities in Clark County was 2.6 in Las Vegas, 4.5 in North Las Vegas, 0.6 in Boulder City, and 3.1 in Henderson (Real Estate Research Corp., 1981).

Over the ten-year period a cumulative total of over 89,000 housing units have been authorized in the county. Of this cumulative total, 36 percent were apartments (five or more unit structures). The split between single family unit and apartment construction activity has remained relatively even in the city of Las Vegas and the unincorporated part of the county. In Henderson and Boulder City, however, the construction of single family residences has predominated. The proportion of single family structures built has varied from a low of 51 percent to a high of 69 percent between 1970 and 1980, with a gently declining trend.

Of the total enumerated county housing stock, over 50 percent has been constructed in the last decade, and approximately 80 percent in the last 20 years (U.S. Department of Commerce, Bureau of the Census, 1970 to 1979, inclusive). Although there are approximately 3,000 empty mobile home spaces in Clark County, there may be a scarcity of empty trailer space, and there is very little undeveloped land that is currently zoned for trailer courts. As of 1979 there were about 5,865 subsidized housing units in the county, with 3,515 and 977 of this total located in Las Vegas and North Las Vegas, respectively.

Clark County is projected to experience an average annual rate of growth of its housing stock of 3.5 percent over the period 1982-1994 under trend-growth conditions. This equates to an increase of 99,424 units from a base in 1982 of 197,774 units. Under-high growth conditions, the increase amounts to 99,696 units from a base of 197,856 units in 1982 with an average annual rate of growth over the period 1982-1994 of 3.5 percent (refer to Table 3.2.3.4.2-1). These rates of growth compare with 2.7 and 2.8 percent, respectively, for trend- and high-growth projections for the deployment region.

In 1980, Lincoln County contained a total of 1,685 housing units, an increase of 642 units over the previous 10 years (an annual growth rate of 4.9 percent). Caliente, the only incorporated community in the county, contained 26 percent of these units and has registered a 3.3 percent average annual growth rate since 1970 (U.S. Department of Commerce, Bureau of the Census, 1981).

Over the period 1970-1979, the annual average number of dwelling unit permits issued numbered only 4.5, but even this low figure is somewhat misleading. The period 1970-1978 showed only a total of 14 units authorized, all of which were single family structures. The activity in 1979 (30 apartment units) is accounted for by the construction of a new senior citizen facility in Caliente (U.S. Department of Commerce, Bureau of the Census, 1970 to 1979, inclusive).

According to a 1973 housing survey by John C. Willie and Associates, 1978, almost 18 percent of all dwelling units in the county were mobile homes. The proportion of mobile homes in the communities is as follows: Alamo had 34 percent, Panaca had 22 percent, Pioche had 8 percent, and Caliente registered 15 percent.

Lincoln County is projected to experience an average annual rate of growth of its housing stock of 3.0 percent over the period 1982-1994 under trend-growth

conditions. This equates to an increase of 612 units from a base in 1982 of 1,440 units (refer to Table 3.2.3.4.2-1). These rates of change compare with 2.7 and 2.8 percent, respectively, for trend- and high-growth projections for the deployment region.

Community Infrastructure (3.4.2.3.6)

Education

In 1980-81, there was a total enrollment of 88,543 pupils in the Clark County School District. Within the district, there are 88 elementary schools, 18 junior high schools, and 5 senior high schools for a total of 111 public schools. In 1980-81 3,930 teachers were employed by the Clark County School District, representing a pupil/teacher ratio of 22.5 to 1. In the 1980-81 academic year, the district reported being over capacity by approximately two percent. Enrollments have increased by 20 percent since 1970-71 (Nevada Department of Education, 1981).

In 1980-81, enrollments in Lincoln County (Caliente area) totaled 952 pupils. Lincoln County has six elementary schools (Pioche, Panaca, Caliente, and Alamo) as well as three senior high schools in Alamo and Panaca. Currently, there is excess capacity for 300 students (Nevada Department of Education, 1981).

Health Care

Coyote Spring

Eight general hospitals, one medical hospital, eight skilled nursing homes, and four intermediate care facilities are located in Clark County. In addition, there are seven adult group care facilities in the county. Other health-related services provided in the area include rehabilitation, family planning, mental retardation, and mental health clinics. Extensive emergency services are available from Las Vegas, including a medical helicopter, two ambulance services, and paramedic services. Clark County has 467 physicians, 1,820 RNs, 605 LPNs, 163 dentists, and 581 emergency medical technicians. There is an excess of hospital beds in Clark County (Office of Economic Adjustment, Community Profiles, 1980).

Health care in Lincoln County is provided in Caliente by one 19-bed general hospital (including a 9-bed convalescent facility), two doctors, fourteen RNs, and three LPNs. In 1979 there were no dentists in the county. Emergency services are provided by 37 emergency medical technicians (Office of Economic Adjustment, Community Profiles, 1980). Lincoln County and the rural areas of Clark County were designated Critical Health Manpower Shortage Areas by the National Health Corps in 1980 due to the shortage of doctors in these rural areas. Lincoln County also has a shortage of psychiatrists, and rural Clark County a shortage of dentists, according to the National Health Corps (Federal Register, Aug., 1980).

Police Protection

The Las Vegas Metropolitan Police Department, an agency with both city and county responsibilities currently employs approximately 961 officers serving a 7,800 square mi area. This department concentrates its service efforts in the urbanized areas of the Las Vegas Valley. Police protection in the rural areas of Clark County

is administered through a resident officer program (which provides living facilities for the officer(s) in the town served). Twelve officers are assigned to the resident officer program. State highways in the area are under the jurisdiction of the Nevada State Highway Patrol. (Office of Economic Adjustment, Community Profiles, 1980).

The Lincoln County Police Department has ten full-time officers and four part-time patrolmen who operate out of three locations: the Sheriff's office in Pioche, with four full-time and two part-time patrolmen; the municipal police force office in Caliente, with four full-time and two part-time patrolmen; and the Nevada Highway Patrol, operating with two officers (Office of Economic Adjustment, Community Profiles, 1980).

Fire Protection

Paid professional fire protection service is provided in Clark County by the Clark County, Las Vegas, North Las Vegas and Henderson Fire Departments. A total of 355 fire fighters provide service to the Las Vegas metropolitan area, while 281 fire fighters serve the balance of Clark County. Las Vegas presently maintains a fire insurance rating of three. Fire protection in the Moapa and Virgin Valley is provided by volunteer fire departments (Office of Economic Adjustment, Community Profiles, 1980).

Volunteer fire protection services are available at several locations in Lincoln County, including: Pioche (20 volunteers), Caliente (20), Caliente-BLM (7), Panaca (15), and Alamo (20). The total pumping capacity of the firefighting in Lincoln County is only 2,950 gallons per minute (Office of Economic Adjustment, Community Profiles, 1980.)

Traffic and Transportation (3.4.2.3.7)

The proposed base site is 46 mi north of Las Vegas, Nevada, along U.S. 93, which provides primary access to the area. Additional access is by State Route 7, which runs southeast from the site until it connects with Interstate 15, about 25 mi away, near Moapa. A schematic map of the existing road network around Coyote Spring with 1980 traffic volumes is presented in Figure 3.4.2.3-1.

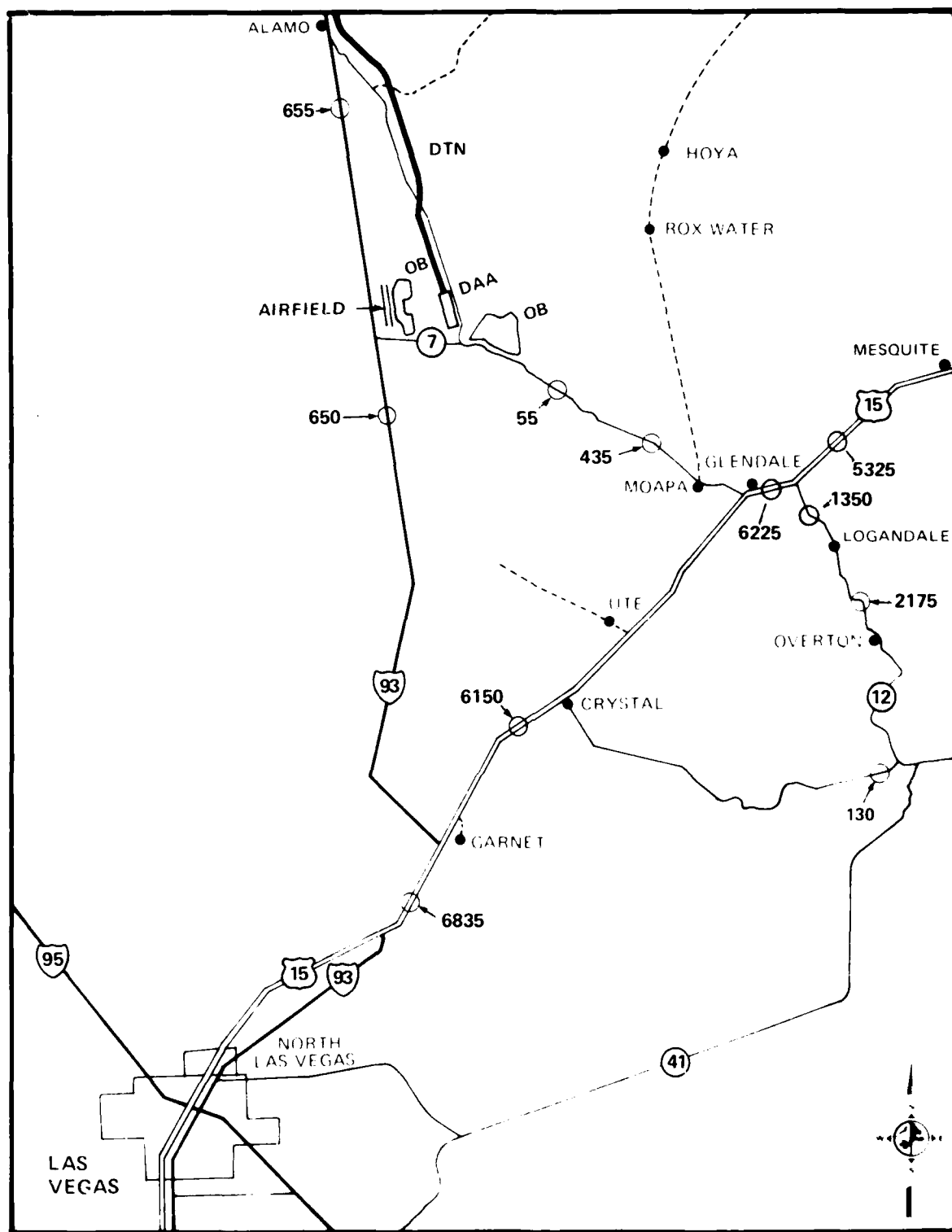
Railroad service is provided by Union Pacific Railroad, although the existing line is about 20 mi from the site. Las Vegas is the site of a major international airport.

Energy (3.4.2.3.8)

Coyote Spring is located approximately 55 mi north-northeast of Las Vegas in a sparsely populated area with no natural gas service. The closest natural gas service is about 8 to 10 mi north of Las Vegas.

The closest petroleum product pipeline is the CAL-NEV Pipeline which terminates at Las Vegas. The bottled gas, fuel oil, gasoline and diesel fuel distributors currently meet the regional demand but are not capable of handling a large increase in fuel demand.

There are no electrical load or power system facilities at Coyote Spring. This area is on the southern boundary of the Lincoln County Power District (LCPD),



LEGEND 000 - 1980 TRAFFIC VOLUMES; COYOTE SPRING, NEVADA

2183 A 2

SOURCE: NEVADA DEPARTMENT OF TRANSPORTATION

SCHEMATIC, NOT TO SCALE

Figure 3.4.2.3-1. Existing traffic volumes in the vicinity of Coyote Spring Valley.

which has a system peak demand of approximately 16 MW. There are no suitable transmission lines in the immediate area. A 69 kV transmission line from the Nevada Power Company-Reid Gardner generating station passes through the area; however, it is operating at capacity and could not supply additional electricity to Coyote Spring. The proposed Intermountain Power Project would have transmission lines running through the Coyote Spring Valley area, with a 500 kV transmission line proposed.

Land Ownership (3.4.2.3.9)

The suitability zone for the Coyote Spring OB in northern Clark County, is located entirely on BLM land. The Desert National Wildlife Range's boundary lies just west of the zone. The suitability zone overlaps six Wilderness Study Areas (see Section 3.4.2.2).

Land Use (3.4.2.3.10)

Urban Land Use

The location of an OB in the Coyote Spring Valley would impact urban lands in Clark and Lincoln counties. General county and community land use data is provided below. See ETR-36, "Urban Planning and Growth," for more detailed information.

Clark County

Urbanization in Clark County, Nevada is dominated by the Las Vegas metropolitan area located in the Las Vegas Valley with smaller settlements located in the Moapa and Virgin valleys. Portions of the following descriptions of existing land use in the Las Vegas Valley have been prepared in response to comments received from DEIS reviewers. These comments suggested that more detailed information on land ownership and land use in Clark County would be appropriate in the FEIS. Within the Las Vegas Valley, Clark County administers the extensive unincorporated area surrounding the cities of Las Vegas, North Las Vegas, and Henderson. Existing land use data in the Las Vegas Valley were collected in 1979 and updated in a 1980 study by the Clark County Department of Comprehensive Planning. These data are displayed graphically in Figure 3.4.2.3.10-1. The largest concentrations of urbanization are found in the City of Las Vegas and in the county between Las Vegas and Henderson. The Las Vegas Valley covers approximately 553,000 acres, of which 351,400 are analyzed for urban development (the remainder of the valley lies outside of the urban area). Almost 299,400 acres, or 85 percent of this urban area, was vacant in 1980. The remaining 52,000 acres were devoted to urban uses. Table 3.4.2.3.10-1 provides a tabulation of the existing land uses in the Las Vegas Valley, as well as in the cities of Las Vegas, North Las Vegas, and Henderson.

Development trends in the period between 1974 and 1979 show that the Las Vegas urbanized area grew by 35 percent, expanding to consume approximately 13,100 acres of formerly vacant land. The developed land use distribution for 1974 and 1979, and a breakdown of converted acres are shown on Table 3.4.2.3.10-2. Residential acreage grew from 1974 to 1979 at approximately the same rate as all urban uses, expanding 35 percent in five years. This means that one in every four acres in residential use in 1979 had been vacant in 1974. In the five year period, an

Table 3.4.2.3.10-1. Existing land use - Las Vegas Valley, Nevada

Land Use	Las Vegas ¹	North ² Las Vegas	Henderson ³	Unincorporated areas	Las Vegas ⁴ Valley total	Boulder City ⁵
Single family residential	8,108	1,403	1,989	14,645	26,442	595
Multiple family residential	N/A	265	124	N/A	3,669	42
Commercial	1,286	478	242	3,512	5,522	37
Industrial	368	1,000	628	2,469	4,465	27
Public facilities	1,800	2,373	969	8,505	11,919	1,243
Developed land subtotal	18,419 ⁶	5,518	3,951	24,129	52,017	1,944
Vacant	19,484 ⁶	16,650	45,329	217,909	299,372	20,006
Total	37,903 ⁶	22,168	49,280	242,038	351,389	21,950

T5083/9-9-81

N/A - Not Available

¹ Earthmetrics Inc., 1977, "Clark County 208 Water Quality Management Plan, Evaluation of Existing Conditions."

² City of North Las Vegas, 1974, "Comparative Land Use Study;" Industrial category updated with 1981 City estimate, Public Facilities category includes 1,571 acres for streets.

³ City of Henderson, 1981, "Henderson Comprehensive Plan Data Index;" Total figure derived from 1981 City estimate.

⁴ Clark County, Department of Comprehensive Planning, 1979 data revised in August 1980.

⁵ Boulder City, 1981, "Master Plan;" Vacant category includes 1,447 acres for utility easement.

Table 3.4.2.3.10-2. Urban land conversion in Las Vegas Valley, Nevada, 1974-1979.

Land Use	1974 Acres	1979 Acres	Net Change	
			Acres	Percent
Residential	22,275	30,078	7,803	35
Commercial	2,141	3,275	1,134	53
Industrial	3,686	4,503	817	22
Public Facilities	8,360	10,966	2,606	31
Resort	1,302	2,026	724	56
Total	37,764	50,848	13,084	35

T5305/9-10-81

Source: Clark County Department of Comprehensive Planning, December 1981, "Task One: Existing Conditions."



Las Vegas offers commercial and recreational facilities, including this neighborhood center. Commercial acreage grew by 53 percent between 1974 and 1979.

average of 1,560 acres per year were converted to residential uses. Commercial acreage expanded by 53 percent over the period, involving 1,135 acres of new development. Industrial land use rose only 22 percent, the slowest growth of any category.

The development patterns of the urban growth in the Las Vegas Valley reflect a combination of public and private decisions related to land use and services. The land use pattern is generally characterized by a patchwork of development interspersed with vacant land. A preliminary analysis by the Clark County Department of Comprehensive Planning indicated that approximately 37,800 acres of vacant land exist within the Las Vegas Valley sewer service area. This is equivalent to 74 percent of all land developed in one form or another in the valley; for every four acres of developed land, three acres remain available within the currently developed portion of the valley. This is land in which a public investment in the form of infrastructure has been made, and upon which no development has taken place. Given the existing ratio of 0.12 acres per person, calculated by Clark County, an additional 315,000 persons could be accommodated on undeveloped land within existing utility service areas, assuming adequate water, sewer, and power capacities were available within the existing infrastructure.

Land ownership plays an important role in land development, and hence land use in the Las Vegas Valley, since over half of the land in the valley is in federal ownership (see Table 3.4.2.3.10-3). BLM is the largest land holder in the valley with approximately 277,700 acres, just over half of the 24 townships in the valley. While this BLM acreage is interspersed with privately-held parcels, public lands form the outer perimeter of the valley, lending definition to the ultimate growth configuration (Figure 3.4.2.3.10-2). Within the incorporated communities BLM land holdings pose other constraints to land development patterns. For example, large portions of the northwestern area of Las Vegas are under BLM ownership. When these lands convert to urban uses there is a high potential for leapfrog development and the associated efficiencies in the provision of municipal services.

Future development of the vacant land in the Las Vegas Valley is constrained by a number of natural and man-made factors. Land development suitability studies, done as part of the "Clark County 208 Water Quality Management Plan," identified areas of the Las Vegas Valley that are constrained by noise, slopes, soils, drainage, and wildlife habitats. Other constraints, such as air quality and infrastructure facilities, e.g. highways, water supply, and sewer capacities can reduce the rate of urban development.

The long range land use planning process for the unincorporated areas of the Las Vegas Valley is handled by the Clark County Department of Comprehensive Planning. At the present time the Department is engaged in a seven-step process to revise and update its current general plan (adopted in 1974). The new comprehensive plan will give the county a framework for growth to the year 2000. The Department has also prepared a study titled "M-X: Growth Management Policy Plan" which describes local goals and policies related to M-X activities in Clark County and analyzed M-X impacts upon the goals. The study examined three alternative scenarios for handling M-X-induced growth. The analysis concluded that the "Las Vegas Valley centered" option, assuming a major impact in the Las Vegas Valley due to a lack of life support facilities at the OB and construction camps, would show the least relative impact if all factors were weighed evenly. Facilities not utilized at

Table 3.4.2.3.10-3. Land ownership in Las Vegas Valley, Nevada.

Ownership	Acres	Percentage
Bureau of Land Management	277,657	50.2
Department of Defense	13,960	2.5
Water and Power Resources Service	9,120	1.6
National Park Service	5,120	0.9
Private, State, Local	247,103	44.9
Total	552,960	100.0

T5303/9-10-81

Source: Clark County Department of Comprehensive Planning, December 1980, "Task One: Existing Conditions."



The Department of Defense, chiefly Nellis AFB, has 13,960 acres of the total 552,960 acres in Las Vegas Valley.

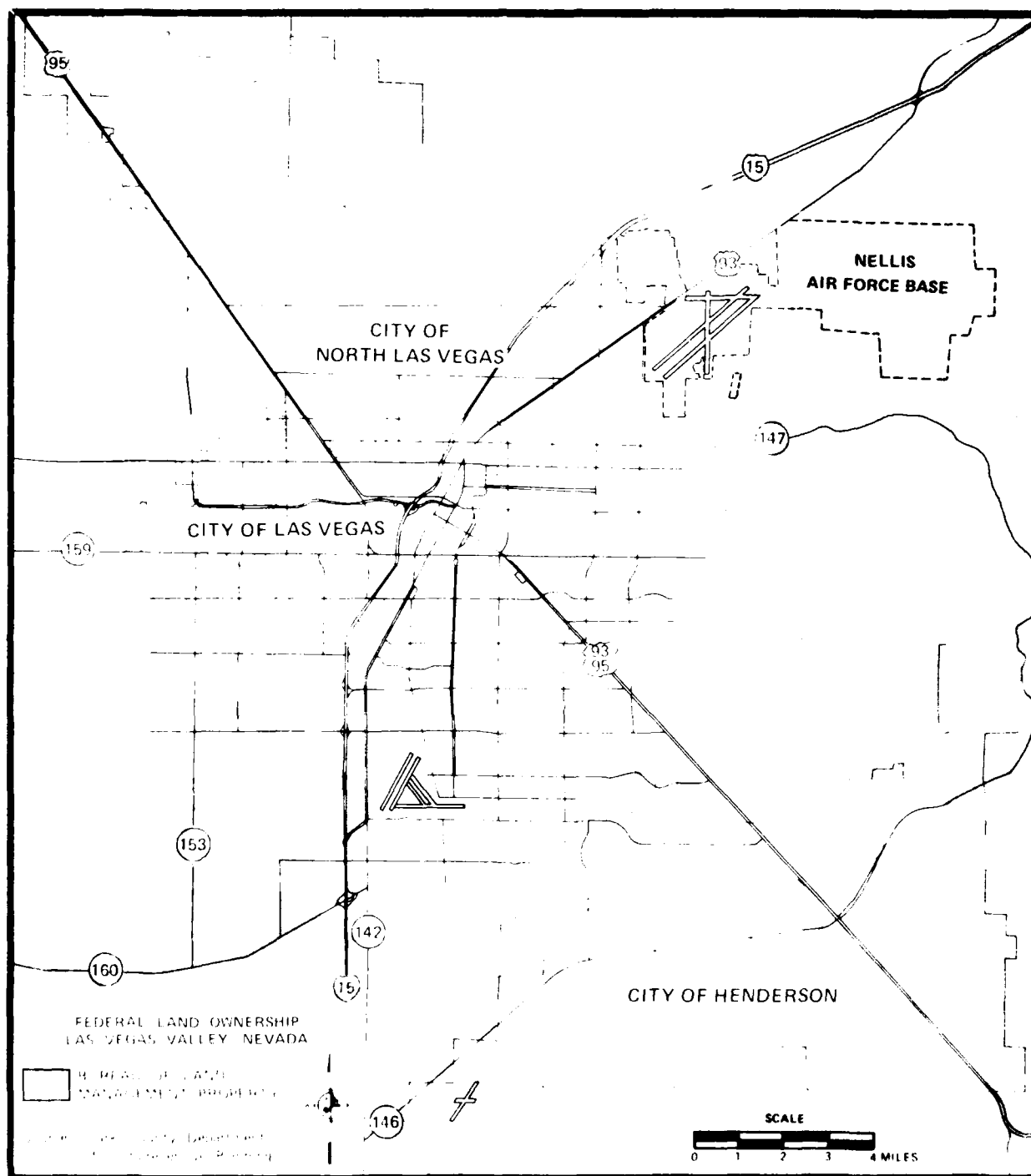


FIGURE 3.1.2.3.10-2. Federal land administered by the BLM in the Las Vegas Valley, Nevada.

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the end of the "bust" cycle would be used by natural growth in the Las Vegas Valley. Information on the adoption dates and status of the master plans and ordinances for all Clark County jurisdictions is provided in Table 3.4.2.3.10-4.

Of the three cities in the valley, the City of Las Vegas has the largest amount of land developed for urban uses: over 18,400 acres as of 1981 (see Table 3.4.2.3.10-1). This is approximately one third of the developed land under jurisdiction of Clark County. The city anticipates that future growth, possibly induced through M-X activities in Lincoln County and Coyote Spring Valley, will take place in the northern portion of the city. However, BLM land ownership, as a proportion of total municipal territory, is very high in this area of the city, and could act as a constraint to efficient land use development. On a city-wide basis BLM owns over 4,000 acres or 11 percent of the city's land area.

The City of North Las Vegas has a total land area of 22,200 acres, of which three quarters is vacant. The spatial distribution of the developed and vacant areas shows that development is located in the southern and south-eastern areas of the city, near I-15 and US-93. Vacant areas extend northward approximately 8 to 10 mi from the developed area. The location of I-15, expected to carry most of the construction and operations traffic to and from the proposed Coyote Spring OB, and the large amount of vacant land makes North Las Vegas the potential receptor of a large amount of M-X-induced growth. Long range planning in North Las Vegas is guided by a general plan adopted in 1974. Although it has been revised since, the utility of the plan has diminished over time and an update is now underway.

The City of Henderson in the southeastern corner of the Las Vegas Valley has the largest land area of the three incorporated cities in the valley, almost 50,000 acres. However, urban development covers less than one tenth of the city leaving the remaining 92 percent of the city vacant. The developed area is clustered around the intersection of US-93/95 and state route 147. Site and environmental constraints due to slope, soils, and stream courses reduce the ability to develop certain areas of the vacant land.

Although Boulder City lies to the southeast of Henderson and outside of the Las Vegas Valley it may be considered part of the Las Vegas metropolitan area. The distance from the Coyote Spring OB is approximately 75 mi and due to the intervening residential opportunities in the Las Vegas Valley, urban growth in Boulder City from M-X would be low relative to the above communities. Like Henderson, less than 10 percent of the land area in Boulder City is developed for urban purposes. The city adopted a "Petaluma type" growth management ordinance in July 1979 in response to problems with sewer capacity (state water quality standards were not being met) and rapid population growth. The theoretical holding capacity for the city under the new master plan shows build-out to be 7,900 acres of urban development.

Within the Moapa Valley area in eastern Clark County are the unincorporated towns of Moapa Valley (recently formed by the merger of the unincorporated towns of Overton and Logandale) and Glendale, and the rural areas of Moapa and Warm Springs. The valley, which is primarily an agricultural area, is the closest settled area to the Coyote Spring OB site, lying about 30 mi to the southeast.

Table 3.4.2.3.10-4. Status of adoption of plans and ordinances in Clark and Lincoln counties, Nevada.

Jurisdiction	Master Plan		Zoning Ordinance		Subdivision Ordinance	
	Date Adopted	Notes (Expected Date of Completion)	Date Adopted	Notes (Expected Date of Completion)	Date Adopted	Notes (Expected Date of Completion)
Clark County	1974	Under revision	1974		1962	
Las Vegas	1972	Under revision (1982)	1978		1978	Major amendment in 1980
North Las Vegas	1974	Under revision	1979		ca 1975	
Henderson	1969	Under revision	1977		1979	
Boulder City	1981		1978		1976	
Lincoln County	1970	Under revision (December 1981)	N/A	Will be revised in 1982	N/A	Will be revised in 1982
Caliente	1975	Under revision (December 1981)	ca 1975		No ordinance	

T5016A/9-21-81/F

N/A - Not Available

Source: Telephone communications with local officials, January-August, 1981.

Approximately 94 percent of the Moapa Valley area is under federal administration with the remaining 6 percent under private ownership. This land ownership pattern has confined land development to the privately owned areas. Federal agencies with ownership or control of land in the Moapa Valley vicinity include the BLM, Bureau of Reclamation, Bureau of Indian Affairs (Moapa Indian Reservation), and the National Park Service.

Since the entire Moapa Valley area is unincorporated, zoning in the area is administered by Clark County. Acreages for the various zoning districts, exclusive of R-U (rural open), are presented in Table 3.4.2.3.10-5. Overton has the greatest amount of land available for urban use, approximately 1,200 acres. Logandale has a large amount of residentially zoned land, approximately 230 acres. Of the total 5,500 acres in the Moapa Valley area 65 percent (3,580 acres) is agriculturally zoned and 35 percent (1,930 acres) is zoned for urban uses.

The Virgin Valley, further to the east along I-15 from the Moapa Valley, is also predominantly agricultural land. By nature of its location along I-15, the unincorporated town of Mesquite is the commercial center of the Virgin Valley. Mesquite has several service industries that support the transient trade between Las Vegas and Utah. Bunkerville is the second settlement in the valley, with a developed area about one half that of Mesquite. According to the zoning area totals (Table 3.4.2.3.10-5), the sizes of Mesquite and Bunkerville are comparable, with approximately 460 and 390 acres respectively.

Lincoln County

Lincoln County, Nevada is north of Clark County and west of Washington, Iron, and Beaver counties in Utah. Three of the four urbanized communities in Lincoln County, Caliente, Panaca, and Pioche, lie in the eastern portion of the county. The fourth urbanized community is Alamo in the central portion of the county. The remaining settlements in Eagle Valley, Rose Valley, Meadow Valley, and Pahrnagat Valley are primarily rural. Long range planning for these communities has been handled through a master plan prepared by private consultants. The 1975 master plan prepared for the county and city of Caliente has been used by the county as a guide for land use decisions although it was not officially adopted by the county. The county and city of Caliente have contracted for the preparation of a new master plan, expected in late 1981. Table 3.4.2.3.10-4 provides further information on the status of land use ordinances in Lincoln County.

The City of Caliente with almost 900 acres of land area is the largest community in Lincoln County (see Table 3.4.2.3.10-6). However, approximately 730 acres or 82 percent of the city is vacant. In 1975, the city adopted the master plan that was prepared in conjunction with the county. Since that time the city has annexed 23.5 acres of vacant land for future use as a mobile home area. As the only incorporated community in Lincoln County, Caliente adopted its own zoning in the mid-1970s.

Panaca and Pioche are comparable in the size of their urbanized areas, with approximately 160 and 110 acres respectively (see Table 3.4.2.3.10-6). Panaca has approximately 120 acres lying vacant and 70 acres in agriculture, while Pioche has 70 acres of vacant land. Alamo, approximately 40 mi north of the proposed Coyote Spring ORB site, is the smallest of the four urbanized communities in the county. Urban land uses exclusive of roads cover only 20 acres of land in the community.

Table 3.4.2.3.10-5. Acreage by zoning district - Moapa and Virgin valleys, Nevada.

Zoning District	Moapa Valley				Virgin Valley		
	Glendale	Logandale	Moapa	Overton	Warm Springs	Bunkerville	Mesquite
R-A Residential Agriculture	1,164.48	--	559.7	316.66	1,539.76	--	--
R-E Rural Estates	--	159.73	--	164.92	--	--	34
R-D Suburban Estates	--	--	--	23.86	--	--	--
R-1 Single Family	--	27.73	--	118.0	--	114	120
R-T Mobile Home	--	39.46	15.86	79.35	--	230	88
R-3 Multiple Family	--	--	--	1.2	--	--	--
T-C Trailer Court	2.1	--	--	13.3	--	--	--
R-U-P Recreational Park	2.9	--	--	--	--	--	--
C-1 Local Business	1.2	12.0	1.72	69.4	--	--	--
C-2 General Commercial	38.26	--	--	120.23	27.6	1	107
H-2 Highway Frontage	43.7	--	--	--	42.9	2	61
M-1 Light Manufacturing	--	--	--	311.45	--	31	--
M-3 Heavy Industrial	--	2.4	298.0	--	--	--	--
P-F Public Facilities	4	16.3	2.12	293.78	--	11	51
Total Zoned Area	1,256.64	257.62	877.4	1,512.15	1,610.26	389	461
T5304/9-10-81					5,514.07		850

Sources: Clark County Department of Comprehensive Planning, April 1981; Ibid., 1979, "Virgin Valley, Nevada, Comprehensive Land Use Plan."

Table 3.4.2.3.10-6. Existing land use Lincoln County, Nevada.

	Alamo		Caliente		Panaca		Pioche		Lincoln Co. Total	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Residential	8.2	5	33.9	4	19.6	5	31.4	17	93.1	6
Mobile Home	3.9	2	6.2	1	8.6	2	2.6	1	21.3	1
Commercial	1.0	1	8.1	1	.8	0	3.7	2	13.6	1
Industrial	--	--	10.6	1	.5	0	3.0	2	14.1	1
Public/Quasi-Public	6.6	4	43.6	5	17.5	5	11.6	6	79.3	5
Streets	35.6	21	50.9	6	117.4	31	58.2	32	262.1	16
Developed Land Subtotal	55.3	33	153.3	17	164.4	43	110.5	60	483.5	30
Agriculture	.1	--	4.8	1	70.7	19	--	--	75.6	5
Vacant	112.3	67	732.1 ¹	82	147.2	38	72.1	40	1,063.7	65
Total	167.7	100	890.1	100	382.3	100	182.6	100	1,622.7	100

T5331/9-23-81/F

¹Includes 23.5 acres of vacant land that have been annexed since 1975.

Source: John C. Willie and Associates, 1975, "Lincoln County Master Plan."

Two-thirds of the land area (approximately 110 acres) in the unincorporated community are vacant, thereby providing room for the community to triple in size.

Grazing

The site is in the BLM Virgin Valley and Caliente planning units. The suitability zone includes parts of 4 allotments and nearly 1,800 AUMs. Four operators use the affected allotments.

Agriculture

There are no croplands within the suitability zone of the proposed Coyote Spring Valley OB. About 1,200 acres of irrigated cropland lie in the Moapa area about two mi east of the zone.

Recreation

Parklands

There are a number of parklands with campgrounds and other recreation facilities within a close distance of the Coyote Spring area (Table 3.4.2.3.10-7). Camping and boating opportunities are present at Lake Mead National Recreation Area. Limited hunting opportunities are available at the Desert Wildlife Range, Pahranaagat National Wildlife Refuge, and Overton Wildlife Management Area.

Parkland areas that are attractive to recreationists from the area because of their facilities development or unique physical characteristics include Lake Mead Recreational Area, with 164,000 acres of surface water, 59 boat launching lanes, and 1,481 overnight campsites. Red Rock Canyon provides both developed and undeveloped camping sites as well as striking scenery. Toiyabe National Forest (Las Vegas Ranger District), 35 mi west of Las Vegas, has five campgrounds with 225 campsites, hunting, and a developed snow skiing resort at Mt. Charleston. Zion and Bryce Canyon National Parks are a little over 100 mi east of the proposed OB site. However, because they are national parks of recognized natural beauty, many visits by M-X personnel are expected. Many of these recreation sites are presently operating at or near capacity.

Water Related Recreational Facilities

Because of Lake Mead Recreation Area, this area is relatively rich in water-based recreational facilities compared to other areas within the DDA. Lake Mead and Mohave Lake total 192,000 surface acres, and provide fishing, boating, and waterskiing, 11,800 linear ft of swimming beaches, and 59 boat lanes. In Clark County there are 16 mi of streams suitable for fishing (Nevada Division of State Parks, 1977).

Snow Related Recreational Facilities

There is one snow skiing area in this region, Mt. Charleston, east of Las Vegas. There are 40 acres of ski slopes for beginning and intermediate levels at Mt. Charleston. Many skiers in southern Nevada use the ski areas at Brian Head, Utah, approximately 150 mi northeast of the proposed OB site. Cross-country skiing and

Table 3.4.2.3.10-7. Parkland recreation areas in the Coyote Spring vicinity.

Site Name	Activities	Units	+ Miles from Coyote Spring
Lake Mead National ² Recreation Area			
Overton Beach	Boating Fishing Swimming Camping Picnicking	1 ramp - - - -	50
Rogers Spring	Picnicking		55
Echo Bay	Camping Boating Picnicking Swimming Fishing	156 sites 1 ramp 92 slips 	65
Desert National Wildlife Range	Hunting	-	10
Pahrnagat National Wildlife Refuge	Hunting	-	40
Key Pittman Wildlife Management Area	Hunting Fishing	- -	55
Overton Wildlife Management Area	Hunting Fishing	- -	35
Valley of Fire State Park	Camping Picnicking	50 sites -	50

T3805/9-29-81/F

¹ Nevada State Highway Department, 1978.

² National Park Service, 1980.

snowplay areas are in short supply in this region, and are primarily in the Spring Mountains east of Las Vegas.

ORV and Other Forms of Dispersed Recreation

There are many ORV areas or areas in the region. Some of the most popular sites include the Las Vegas Dunes, immediately north of Nellis Air Force Base, and Dry Lake river basin in Dry Lake Valley 30 mi south of the proposed OB site. One of the nation's largest ORV events, the Mint 400, is held annually in the Dry Lake Area.

There are over 200 mi of mountain trails (hiking and vehicle) in this region, primarily in the Desert National Wildlife Range and in the Mt. Charleston area (Nevada Division of State Parks, 1980). Red Rock Canyon and Valley of Fire State Park are popular areas for hiking, photography, sightseeing, etc., for most of the year.

Recreation Within the Suitability Zone

No fishing or developed recreation sites are within the OB suitability zone (Figure 3.4.2.3.10-3). Since the region is predominantly in the public domain, it is subject to dispersed recreational use. The Coyote Spring area is used by off-road vehicles. The land in and around the Arrow Canyon Range has been proposed for inclusion in the Nevada State Park System.

Mining

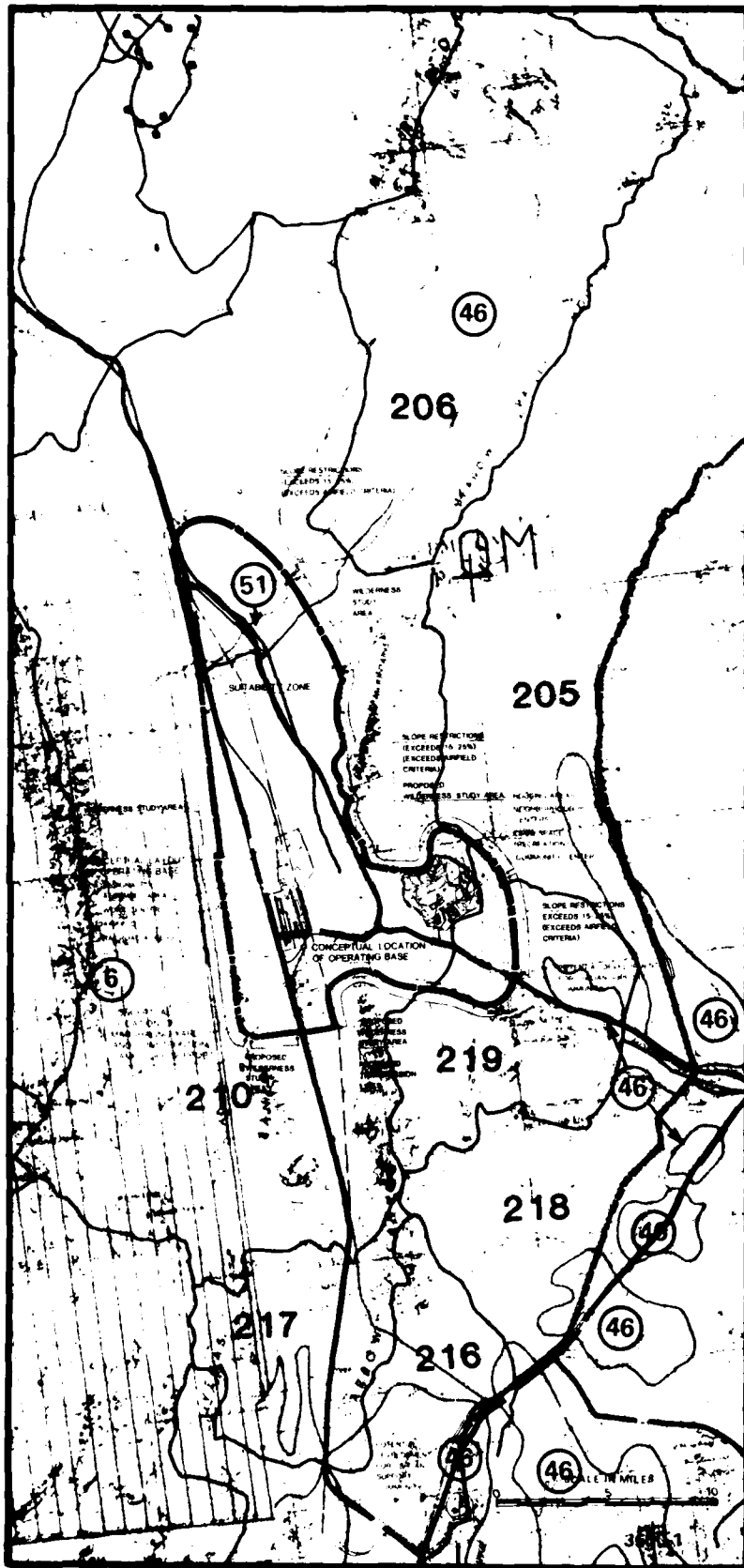
There are no known mines in the area, and the potential for future mining activities is expected to be low. There is no known oil or gas exploration.

Native Americans (3.4.2.3.11)

Native American Cultural Resources (3.4.2.3.11.1)

Southeastern Nevada was a major Southern Paiute population center in late prehistoric and early historic times, and is therefore associated with dense habitation site concentrations and a wide variety of features which are culturally sensitive to local Indians. In Delamar Valley, Kane Springs Wash, Pahranaagat Wash, and along the entire course of the Muddy River to the confluences of Meadow Valley Wash and the Virgin River there are dense concentrations of documented ancestral campsites and farming settlements. Today, these locations are utilized as hunting and gathering areas by the Moapa Southern Paiutes. Immediately west of the proposed OB site is the Sheep Mountain National Register District. In this district, there are ancestral habitation sites of high density and unusual integrity.

Preliminary Native American field studies were conducted in the region during the summer of 1980, but cultural resources in the area of potential direct disturbances are presently incompletely documented. The Muddy River area, however, is known to contain dense concentrations of historic and prehistoric village sites, as well as important sites which are culturally sensitive to local Southern Paiutes. The foothill and mountain regions surrounding the proposed OB site contain important pine nut groves and spiritual areas. Arrow Canyon, immediately adjacent to the site location, contains burials and petroglyphs, and the entire Arrow Canyon



LEGEND	
(6)	DESERT NATIONAL GAME RANGE
(46)	ORV USE AREAS
(51)	KANE SPRING WASH

4720-A-1

Figure 3.4.2.3.10-3. Recreation sites in the proximity of Coyote Spring Valley.

Range is regarded as sacred by Moapa Southern Paiutes. In addition, lowland regions of the OB siting area support native fauna, such as the desert tortoise, which have significance in traditional cosmologies; and native flora, which continue to be used by local Indians for foods, medicines, and craft materials (See Table 3.2.3.9-1). Additional cultural resource data for a Tier II analysis will be gathered in field studies at the Moapa Reservation.

Native American Land/Water Resources (3.4.2.3.11.2)

The Moapa Indian Reservation is the only Native American reservation in the vicinity of the proposed Coyote Spring OB. The reservation is located approximately 10 mi southeast of the OB site. The Las Vegas Colony, a 12.5 acre urban residential tract, will not experience land or water effects as a result of OB siting at Coyote Spring.

The Moapa Indian Reservation consists of 72,012 acres located 40 mi northeast of Las Vegas. In December of 1980, 70,566 acres were added to the previous 1,446 acre reservation (see Appendix A to ETR-21 for summary of land issues and descriptions).

Outside the area recently acquired, over 450 acres are irrigated and producing hay and ensilage. An additional 300 acres remain unirrigated or fallow farmland. Non-irrigable land of the pre-1980 reservation was used primarily for residential purposes, including a 40-unit HUD housing project built by a tribal construction company. In addition, the Moapa began a greenhouse horticulture program in 1978 cultivating tomatoes. Their "Paiute Brand" tomatoes were being sold to hotels and retailers in Las Vegas and Phoenix and they were experiencing considerable success in penetrating these markets. Later they expanded their operation to include cucumbers. However, in September 1980, a freak hailstorm hit the Upper Muddy area and destroyed 80 percent of the greenhouses.

Numerous sites in the vicinity of the Moapa Reservation were identified by Nevada Southern Paiutes (from Moapa Reservation and Las Vegas Colony) as important hunting and/or gathering areas. These included: Kane Springs Wash, Meadow Valley Wash, Coyote Spring, Delamar Flats, and the Sheep Mountains. Important floral and faunal resources found in these areas include: willow trees, Indian spinach, sage, cactus, mesquite, rabbits, tortoises, deer, pine nuts, Indian tea, yucca and squawberries. Many of these resources are hunted and gathered for dietary supplements; some plants and herbs are collected for their medicinal value. Willow trees are valued for their pliable wood used in making cradle boards. The Indian reservation straddles the spring-fed Muddy River in the upper part of the Moapa Valley.

The Muddy River is at the downstream end of a topographic trough that includes, from north to south, White River Valley, Pahroc Valley, Pahrangat Valley, Coyote Spring Valley, and Moapa Valley. The White River channel, which flows through this trough, and groundwater from adjacent ranges, notably the Sheep Range to the west and the Delamar and Dry Lake valleys to the east, provide the groundwater recharge for Muddy River Springs (Eakin 1963, 1964). Discharge from these springs is the source of the Muddy River. (For additional information, see ETR-12 (Water Resources)).

The Muddy River and twenty-one natural warm springs at the north end of the valley are the principal sources of water for the Moapa Reservation and the Moapa are vulnerably dependent on those resources. Because the Moapa Valley is arid, characterized by low precipitation, high temperature and high evaporation rates, the groundwater recharge for the springs is very important. The Muddy River Springs "are the base of the agricultural economy of the Moapa Valley" (Eakin 1964:12) and agriculture is an economic mainstay of the Moapa Reservation. Furthermore, agriculture-irrigated cropland and greenhouse horticulture, both water dependent, are central to Moapa's economic development plans.

Socioeconomic Characteristics (3.4.2.3.11.3)

There are over 200 Moapa Reservation residents. The population has been growing because of new housing units becoming available and because of new economic opportunities on the reservation. The Moapa have the most diversified economy of any reservation in the study area. In addition to ranching, farming, and greenhouse horticulture, the tribe operates a leather shop, construction company, grocery store, and auto repair shop. These tribal enterprises provide employment for 62 members; unemployment is decreasing and earned income is up sharply--those earning over \$5,000 a year rose from eleven in 1977 to fifty-eight in 1980.

The economic climate at Moapa, unlike that at most other reservations, is healthy enough to retain members of the labor force. The age distribution indicates that the labor force is not leaving en masse. Hunting and gathering activities are important to the Moapa, but it is not possible to determine the importance attached to these practices; they appear to be becoming increasingly social and religious rather than economic in nature.

There are about 100 Southern Paiutes in the Las Vegas Colony. An additional three families of Chemehuevi Indians have been living on the colony for three generations. There are two tribally owned smokeshops and a construction company. Current income levels are not known, but unemployment rates are the lowest in the study area, less than one percent.

Archaeological and Historic Resources (3.4.2.3.12)

The recent survey of Coyote Spring Valley (EDAW 1981a) has presented the only systematic discussion of the archaeological potential of the area. The following discussion of the area's prehistory is based on this source.

The Coyote OB vicinity zone encompasses a number of features with known areas of high site density, including Coyote Spring, Kane Springs Wash, Pahrnagat Wash and its unnamed tributaries, and the Muddy River.

The vicinity zone contains lithic resource areas that were used prehistorically. Chert quarries are known in the areas immediately west of the vicinity, and numerous lithic scatters and temporary camps are expected there. Southwest of the confluence of Pahrnagat Wash and Muddy River, on bluffs overlooking the valley floor, is an immense scatter of obsidian artifacts. Obsidian is abundant in the Kane Springs area, and sites related to quarrying activities are expected for this area as well.

As mentioned, sites are known to occur along Pahrangat Wash. These sites consist primarily of lithic scatters. Temporary camps may occur as well.

Larger, more dense concentrations of artifacts occur near springs. Coyote Spring has sites clustered around it, and a large, dense scatter of artifacts is known from an area near an unnamed, heavily vegetated wash associated with an extinct spring or catchwater basin. Large sites near springs probably result from repeated use of the site by small groups over a long period of time. The only diagnostic artifacts recovered during the survey noted above were Pinto and Gypsum projectile points, indicating Archaic use of the area. The lack of historic sites older than 20 years reflects the absence of a major route west of Pahrangat Valley until the 1960s.

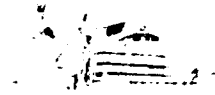
The portion of the vicinity zone that falls within the Muddy River Springs watershed probably contains more sites and artifacts than any other. A cluster of four large springs and the Muddy River were heavily used by the Virgin Branch Anasazi who lived and farmed the bottomlands of the Muddy - Virgin - Moapa Valleys. Agriculturalists normally occupy sites for long periods and, as a result, these sites often contain substantial evidence of occupation. Historic sites such as dams, ranches and associated structures abound in this drainage as well.

Archaeological and Historical Resources

Paleontologic Resources

When the White River was flowing during Pleistocene time it cut through deposits of older lake bed sediments in the bottom of Coyote Spring Valley. While fossils are not known from these sediments, they are potentially fossil bearing. Just south of Coyote Spring Valley, the river bed cuts through the Muddy Creek formation which, near Moapa, contains a fossil vertebrate fauna. Paleozoic rocks containing fossils occur in the mountains east and west of Coyote Spring Valley.

Delta



DELTA

Introduction

The area of analysis (AOA) for the Delta operating base includes Millard County. The AOA is located in the central section of the designated region of influence (ROI) as shown in Figure 3.4.3-1. Delta and Fillmore are the major settlements in the AOA. This section and Chapter 5 detail important environmental characteristics of Delta and vicinity and the proposed base site, respectively. Construction and operation of an OB is discussed in Section 4.3.

Millard's first settlement was in Fillmore in 1851, which established the territorial capital of the Utah Territory. Railroads helped develop agriculture in this area. In 1878, the Utah Central Railroad was completed through West Millard County to Millard in Beaver County. The Utah Central later joined Utah Southern Railroad at Lynndyl. The Union Pacific Railroad extended a spur line to Fillmore in 1923 to ship sugar beets, grain, and livestock to markets.

Agriculture has continued to dominate the economy of Millard County, accounting for about one-third of the total 1977 county work force of 3,400. Principal agricultural products include feed grains, meat, and dairy products. The primary food processing center is Delta, with Delta Valley Farms and Terrel Meats. Mountain Mushrooms, with 120 employees, produces and processes mushrooms.

Quality of Life, Millard County, Utah (3.4.3.1)

Delta is a small community located in a cluster of small towns, which are primarily agricultural character. Delta is the center for alfalfa seed production in the state and is dependent on irrigation from the Sevier River. Millard County population was slowly declining, but from 1970 to 1977 this trend has reversed with the county growing at a rate of 2.5 percent (Table 3.4.1.1-1).

The region has had a long period of out-migration as the number of farms has declined since 1940. Those residents who remain are typically those with a strong attachment to their community as home. In fact, a recent survey of residents of the

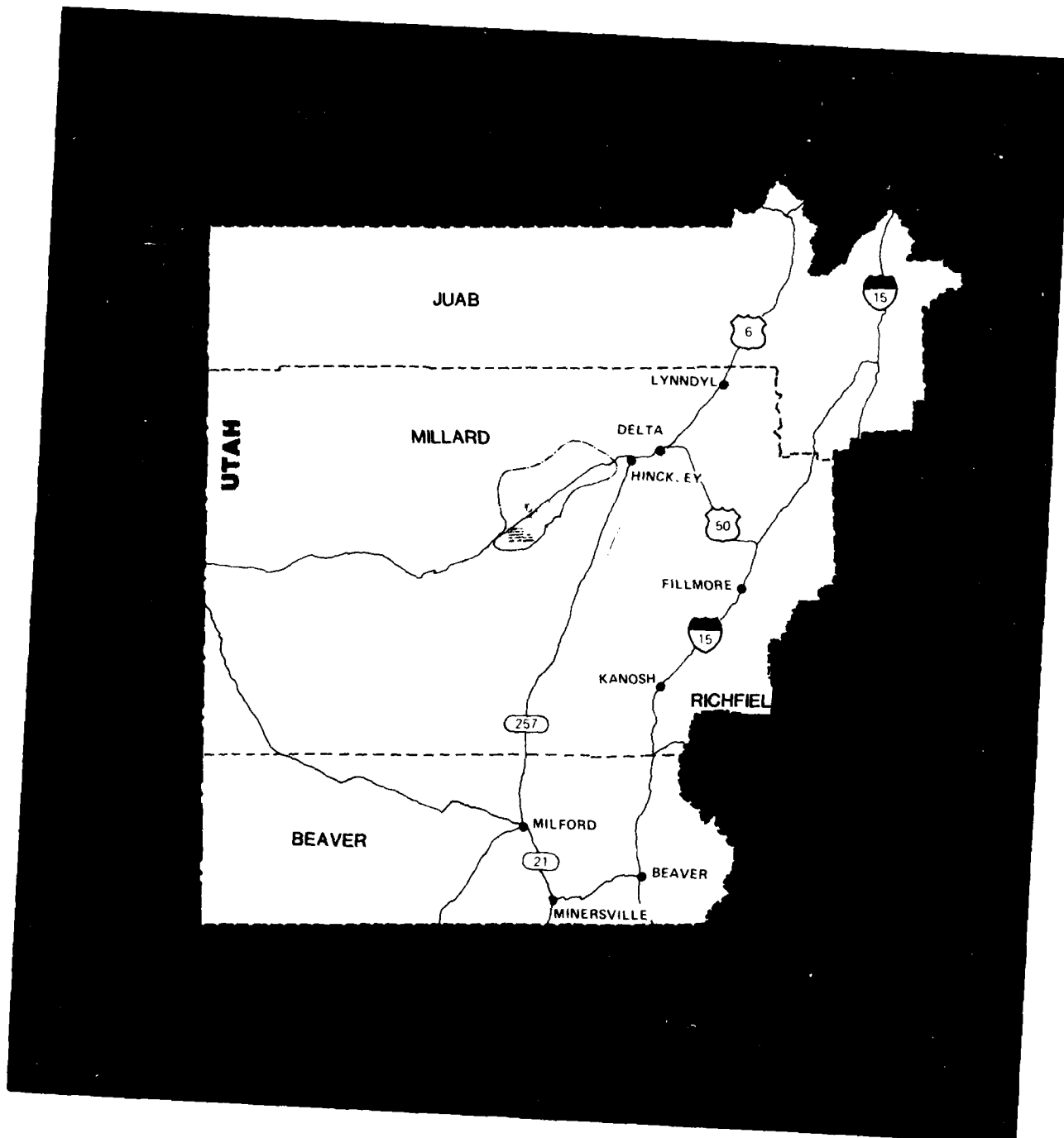


Figure 3.4.3-1. Area of analysis (AOA), Delta.

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Delta area, showed that 99 percent of county residents considered the town they live in as home. They further indicated that they would leave only with reluctance and two-thirds reported that the area they live in is about the "best community" they could live in (Architects/Planners Alliance, Inc. 1979).

Delta and the surrounding small towns, Desert/Oasis, Hinckley, Leanington, Lyndyl, Oak City, and Sugarville are agrarian, with agriculture being the highest employment sector. High operating costs and low profit margins contribute to a low per capita income in the county. The 1977 per capita income was just under \$4,000/year, only 67 percent of the state average (Table 3.4.1.1-1). Wages are currently low in most employment sectors, but this probably would change if projects such as the Intermountain Power Project (IPP) were to locate in the area. The marginality of some farm operations is indicated by the observation that many farmers voluntarily sold their water for irrigation rights to the IPP, exchanging their traditional way of life for a guaranteed financial return.

The unemployment rate in the county is very low at 4.7 percent, and the civilian labor force has been growing between 1970 and 1977 at the rate of 3.3 percent/year, somewhat below the state average of 5.6 percent, but well above the national average of 2.4 percent. Just over 20 percent of the county's population was on public assistance support during 1976, close to the national rate but well above the state average of 14.7 percent (Table 3.4.1.1-1). The economy of the area is somewhat stagnant compared to the rest of the state.

Whereas residents view their community in very favorable terms, this is not to say that it is ideal in all regards. The public attitude survey indicated the perceived important advantages of the community were "access to outdoors," "air quality," and "community spirit," while significant disadvantages were "appearance" and "opportunity to earn a living," which were rated by local citizens as needing improvements (Architects/Planners Alliance, Inc. 1979). The perception of economic disadvantages associated with the area strongly disposes the local population to support additional economic growth for the region. Growth of new employment opportunities is perceived as the basis for reversing the flow of migrants out from this area.

The appearance of the communities had been described as part of the environment that "needs improvement." Related to this attitude is the observation that the median value of housing is well below that for the state as a whole. While the housing stock may consist of older homes, and of low dollar value, they are overwhelmingly owner-occupied single family dwelling units. Utah tends to have large families. This fact coupled with the older homes in the area is reflected in the statistics on occupancy. More than 10 percent of the housing units had over one person per room in 1970. The state average is just under the rate observed for Millard County, and is a full two percentage points above the national norm of 8.0 percent. The distribution of trailer houses is low, being only 2.8 percent of the housing stock in 1970.

In Millard County both crime rates and the proportion of police officers are very low, in comparison to Utah state and national levels (Table 3.4.1.1-1). Crime rates are usually directly correlated with levels of social stress in a community. Stress indicators correlate positively with crime rate data as Millard County shows low rates of divorce, suicide and alcoholism. Suicide rates are problematic for areas

of very small population because they are calculated in terms of rate/100,000 population and in a small county the rate is based on too small a sample to be a reliable statistic. Suicides are very rare here, however, as only one suicide is recorded between 1970 and 1976. District 4, which includes Millard County, had a rate of 9.4/100,000 population, well below the state and national averages. Alcoholism rates are estimated at 19.3/1,000 population, close to the state mean, but less than half the national alcoholism rate of 42/1,000 population. Reflecting the long term stability of families and strong community norms about divorce, the incidence is at an exceptionally low rate. The divorce rate in Millard County is 1.7/1,000 population, only about one-third the state divorce rate of 5.1/1,000 population (Table 3.4.1.1-1).

The low ratings on variables reflecting social stress reflects in part local institutions providing community goods and services. In particular, "quality of religious life," "programs for the aged," "schools," " " and "effectiveness of local government" are given exceptional ratings in terms of their adequacy and availability. These social and political institutions provide the local population a high degree of integration, cohesion and community stability. These high quality factors are partially offset by the feeling that "facilities for youth," "shopping," "cultural activities," and "restaurants and entertainment" need improvement.

As indicated above, schools are evaluated by local residents as exceptional, indicating a very high level of satisfaction concerning their adequacy. Additional facilities for youth are evaluated as much less adequate. However, objective indicators, suggest that county educational institutions do not appear as exceptional. Apparently, their effectiveness is only partially determined by their pupil/teacher ratio of 23.4:1, slightly better than the state average of 24.8:1. Median school years completed at 12.4 for Millard County is slightly less than the Utah and national median of 12.8 and 12.5, respectively (Table 3.4.1.1-1). Nevertheless, this is a high level of education considering that Millard is a rural county with an older population distribution. Recreation is available throughout the county on the large BLM landholdings and in Forest Service land along the eastern side of the county. Parks and playgrounds are evaluated as satisfactory by residents of the county, with some communities appearing to have better facilities than others. Access to the outdoors is viewed as exceptional in the area, and was identified by residents as a major advantage of the Delta area.

Natural Environment (3.4.3.2)

The following sections describe existing characteristics of the natural environment of the Delta Operating Base Vicinity. Topics covered include Water Resources, Erosion, Air Quality, and Biological Resources.

Water Resources (3.4.3.2.1)

The Delta site area is located within the Sevier Desert, which covers about 3,000 square mi, and is within the Sevier hydrologic unit as defined by Utah State University (1963). Mower and Feltis (1968) identified the three principal aquifers within this area as valleyfill deposits, fractured volcanic rocks of Tertiary age, and fractured carbonate rocks of Paleozoic age. The valleyfill deposits consist of interbedded gravel, sand, silt, clay, and evaporites. The evaporites are located primarily in the playa area in the west-central portion of the valley. Gravel and

sand exist mainly in alluvial fans along the margins of the valley. Extensive cementation has occurred in the older valleyfill materials. The fractured volcanic rock aquifer is composed of tuffs and lava flows. The Paleozoic carbonate rocks crop out in the mountain ranges flanking the valley and provide conduits for water to the younger valleyfill deposits.

The water table within the valleyfill aquifer slopes to the southwest as well as toward the valley axis (Mower and Feltis, 1968). Records compiled by the U.S. Geological Survey (1979) and the groundwater level measurements taken by Fugro National in 1979 and 1980 indicate that the depth to groundwater is less than 10 ft in the Delta area, with several flowing wells reported. However, depths to water exceed 200 ft along the valley margins at higher topographic elevations. The Utah Division of Water Resources (UDWR, 18) reported that a slight rise in groundwater levels occurred between 1977 and 81, but that an overall decrease of about 6 ft has occurred since 1955.

The principal sources of groundwater recharge are probably seepage losses from streams, the Sevier River, and canals and irrigation ditches. Most of the precipitation providing recharge falls as snow during the winter on the coarse unconsolidated sediments along the north and east edge of the basin.

A more detailed presentation of the hydrology in the Delta area is presented in ETR-12.

Water Availability

Eakin, Price, and Harrill (1976) made a provisional total water system yield approximation of over 100,000 acre-ft/year; however, this quantity also includes the surface water system. Surface water discharge measurements recorded by Hahl and Mundorff (1968) for the Sevier River indicate that discharge between the towns of Lynndyl and Desert decreased by 105.5 cfs or 72,600 acre-ft during 1968 due to diversion, evaporation, and losses to the groundwater system. This would reduce the water yield of the area to about 27,400 acre-ft/year, principally groundwater. A perennial yield of 25,000 acre-ft is estimated for the groundwater system in the Sevier Desert area (Price, 1979).

According to UDWR (1978), groundwater usage in the Sevier Desert averaged 28,000 acre-ft/year for the fifteen year period from 1963 to 1977. Recent groundwater withdrawal has significantly increased, however, reaching 50,300 acre-ft in 1977. Of that amount, 46,800 acre-ft were used for irrigation, 2,000 acre-ft were extracted for industrial use. Municipal and domestic pumpage used an additional 1,500 acre-ft.

Erosion (3.4.3.2.2)

The soils of the Delta OB site have developed on lake plains and lower piedmont slopes with slopes generally 0 to 2 percent. Major soils within the OB site area generally have fine or medium textured surfaces. Thus, for major soils, the Delta OB site area has a relatively uniform moderate susceptibility to wind erosion. The water erosion hazard for this area is slight because of the gentle slopes (U.S.D.A., 1977a).

Air Quality (3.4.3.2.3)

A summary of some climatological parameters relevant to air quality appear in Table 3.4.1.2-1. Particulate emissions for Millard County are 4,541 tons/year from all sources except windblown fugitive dust. The baseline levels in Millard County for CO, SO_x, NO_x, and hydrocarbons are listed in Table 3.4.1.2-2. Delta receives an average of 7.16 in. of precipitation per year. This precipitation is evenly distributed throughout the year and is not considered an important factor in controlling dust.

Biological Resources (3.4.3.2.4)

Vegetation and Soils

The potential OB site in the Delta area includes grassland, shadscale scrub, and alkali sink scrub vegetation-types (Figure 3.4.3.2-1). The site is located west of Delta, on the floor of the Sevier Desert. The vegetation types found in the Sevier Desert watershed boundary include those listed above and Great Basin sagebrush, riparian woodland, pinyon-juniper woodland, some agricultural areas, and grassland.

Shadscale is the major vegetation type occurring in the Bonneville Basin area of Utah, which includes the OB site. The typical species are shadscale (Atriplex confertifolia), bud sage (Artemisia spinescens), and sticky-leaved rabbitbrush (Chrysothamnus viscidiflorus). Another vegetation type is alkali sink scrub. The characteristic species of this vegetation type are greasewood (Sarcobatus vermiculatus), and green molly (Kochia americana).

Alkali sink scrub and shadscale predominate in the Sevier Desert watershed; they form a mosaic pattern across most of the valley bottom. Shadscale scrub occurs in several different subtypes, including pure stands of winterfat and shadscale.

Grassland areas occur in the Sevier Desert watershed, including the area surrounding Carr Lake, near Beaver River east of the Cricket Mountains, and near White Sage Flats, southwest of the town of Kanosh.

Great Basin sagebrush occurs in the south-central portion of the watershed, on the old lava flow area to the north of Tabernacle Hill, in the Cricket and Swasey mountains to the west, and in the northern section of the watershed. It is dominated by several sagebrush species (Artemisia tridentata, A. nova, and A. arbuscula), sticky-leaved rabbitbrush (Chrysothamnus viscidiflorus), and Mormon tea (Ephedra viridis).

The Sevier River runs year-round, with riparian vegetation along the banks in some areas. Cottonwoods (Populus fremontii), willows (Salix spp.), and possibly tamarisk (Tamarix sp.) are the common trees along the river.

Pinyon-juniper woodland occurs in the mountains and high bajadas above the 5,500 ft elevation level. Utah juniper (Juniperus osteosperma) and pinyon pine (Pinus monophylla) dominate the community, with shrubs such as big sagebrush and antelope brush (Purshia tridentata) comprising the understory.

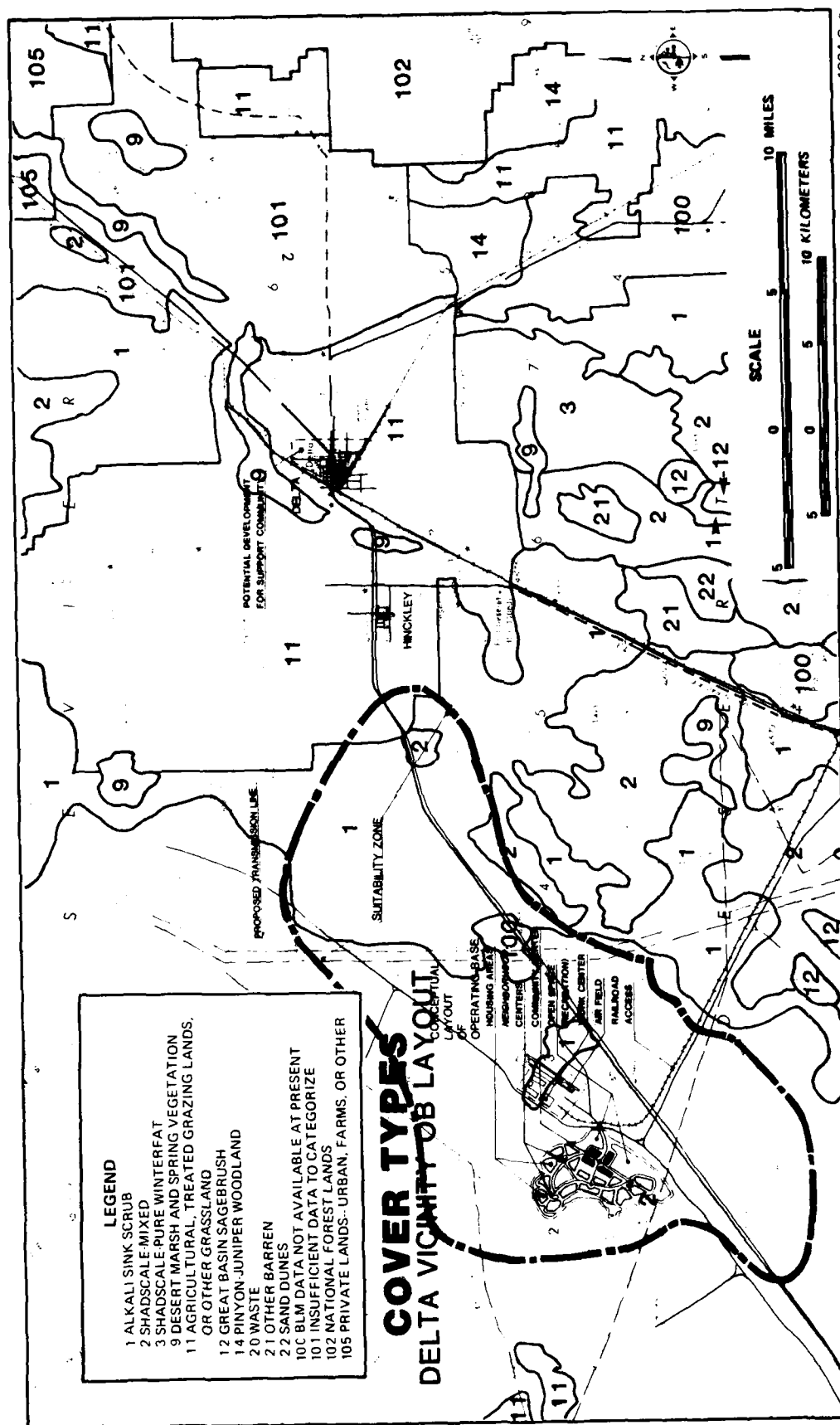


Figure 3.4.3.2-1. Vegetation cover types in the vicinity of Delta.

The soils of the site are formed on lake plains and terraces with slopes generally 0 to 2 percent. Playas are found throughout the area. The soils are arable if water for leaching and irrigation is available, however presently, sufficient water is not available. Several soil series are found in this region, but in the predominant series, permeability is very slow, runoff is slow, and the hazard of erosion slight. In other areas, runoff erosion is moderate. The engineering properties of the soils are a high potential frost action, low to medium shear strength, and medium compressibility.

Wildlife

Mule deer are found in the Drum and Little Drum mountains, to the west in the House Range, and to the south in the Cricket Mountains. Pronghorn range occurs throughout much of the Sevier Desert including over half of the OB area. No key habitat is located in the OB suitability zone. Waterfowl are located at the Topaz State Waterfowl Management Area approximately 20 mi northeast and at Clear Lake State Waterfowl Management Area, approximately 15 mi to the southeast.

Aquatic Species

Gunnison Bend Reservoir and the Sevier River are aquatic habitats within the more urban area of Delta. Game fish in these habitats are mostly warmwater species (channel catfish, white and largemouth bass, yellow perch, bluegill, walleye, and crappie). The Sevier River and short streams in canyon drainages of the Pavant and Canyon mountains southeast of Delta also contain game fish, principally trout.

Protected Species

No protected or proposed protected terrestrial animals are in the immediate vicinity. The federally protected bald eagle has been sighted throughout the Sevier Desert in winter. Many sightings have occurred 20 mi east of the proposed OB site near Greenwood, Utah. Several bald eagles winter at Fish Springs National Wildlife Refuge, about 50 mi northwest of the proposed OB site. Peregrine falcons may nest in the Canyon Mountains, 30 mi from the proposed site. The terrace buckwheat (*Eriogonum natum*) occurs near the candidate site. The nearest protected aquatic biota occur 55 mi west of the candidate site (Figure 3.4.3.2-2).

Wilderness/Natural Areas

Wilderness resources within a 100 air-mile radius of the Delta OB site are listed in Table 3.4.3.2-1. Significant natural areas within a 50 air-mile radius are listed in Table 3.4.3.2-2.

Human Environment (3.4.3.3)

The following sections describe baseline socioeconomic and cultural characteristics of the Delta Operation Base Vicinity Environment. Included are: Employment, Income and Earnings, Public Finance, Population, Housing, Community Infrastructure, Traffic and Transportation, Energy, Land Ownership, Land Use, Native Americans, and Archaeological/Historical Resources.

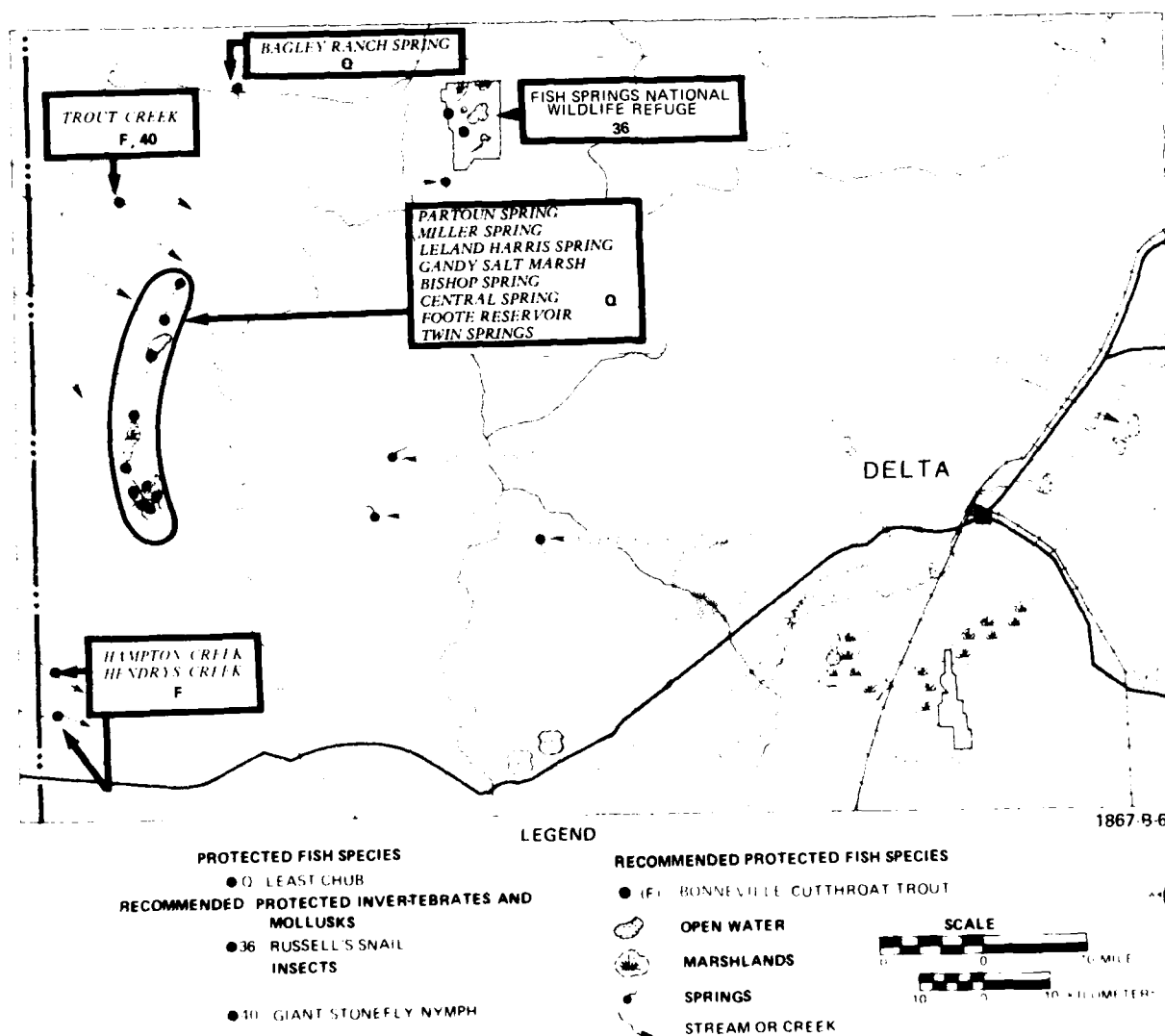


Figure 3.4.3.2-2. Locations of protected and recommended protected aquatic species near Delta.

Table 3.4.3.2-1. Wilderness resources within a 100 air-mile (160.9 km) radius from the potential Delta OB site .

State	Wilderness Resources	
	Approximate Miles From OB Site	Approximate Km From OB Site
Nevada		
Granite Spring	58	93
Mount Moriah	60	97
Wheeler Peak	67	108
Highland Range	68	109
Fortification Range	90	145
White Rock Range	92	148
Table Mountain	95	153
Mount Grafton	99	159
Parsnip Peak	100	161
Utah		
Swasey Mountain	12	19
Notch Peak	16	26
Howell Peak	18	29
King Top	28	45
Fish Springs Range	33	53
Conger Mountain	36	58
Rockwell	39	63
Dugway Mountains	45	72
Wah Wah Mountains	46	74
Granite Spring	58	93
Deep Creek Mountains	58	93
Central Wah Wah Range	60	97
Nephi	71	114
Mountain Home Range	73	117
Santzguin	75	121
White Rock Range	92	148

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¹ Wilderness resource areas outside the states of Nevada and Utah were not included in this evaluation.

Table 3.4.3.2-2. Significant natural areas within a 50 (80 Km) air-mile radius of the potential Delta OB site.

Significant natural area	Approximate distance from OB site	
	Miles	Km
Nevada		
None	--	--
Utah		
Topaz Marsh Waterfowl Management Area	15	25
Antelope Spring Trilobite Beds	15	25
Clear Lake Waterfowl Management Area	20	30
Fumarole Butte	25	40
Kolob Mesa Research Natural Area	35	55
Partridge Mountain Research Natural Area	40	65
Fish Springs National Wildlife Refuge	45	70
Deep Creek Mountains	50	80

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Employment and Labor Force (3.4.3.3.1)

The Delta OB option is located in the northeastern part of the Nevada/Utah region of influence (ROI). The area of analysis (AOA) consists of Millard, Beaver, and Juab counties in Utah. The discussion of employment and labor force for Beaver County appears in Section 3.4.1.3.1 of this chapter. A detailed analysis of the employment and labor force in the AOA is presented in Section 2.1.3.3 of in ETR-44. The proposed OB site is located just north of U.S. Highways 6 and 50, about 20 miles west-southwest of Delta. For the Proposed Action, the Delta OB would not be constructed. This OB site would be used as a second OB under Alternative 2. Other alternative OB sites under consideration include, Coyote Spring and Ely, Nevada; Milford and Beryl, Utah; Clovis, New Mexico; and Dalhart, Texas.

The economies of the AOA counties are primarily dependent on government, trade, and agriculture. In Millard County, Delta and the surrounding communities--Desert/Oasis, Hinckley, Leamington, Lynndel, Oak City, and Sugarville-- are small agrarian communities. However, manufacturing and construction sectors are expected to increase because of proposed projects in the area. These projects include the Intermountain Power Project, Continental Lime cement plant, and Precision Built Modular Home Manufacturing. The Martin Marietta cement plant is currently under construction in Juab County. These projects are expected to have a significant influence on the economy and population of the AOA counties.

Recent Labor Force Trends

Millard County

The size of the labor force in Millard County has shown a general upward trend from 1986 to 1980, increasing from 2,760 workers to 3,685 during this period. The most significant change in the county labor force occurred in 1975 when the number of available workers increased by more than 400. Employment moved with this labor force trend, increasing from 2,620 workers in 1968 to 3,470 in 1980.

Unemployment levels fluctuated between 140 and 227 persons between 1968 and 1977 and then fell to record lows in 1978 and 1979. During those respective years, 120 and 115 workers living in the county were unemployed, as the unemployment rate dropped to 3.6 and 3.3 percent. In 1980, the unemployment level rose by 100 workers to 215, 5.8 percent of the labor force.

Juab County

The size of the labor force in Juab County has shown an increase of about 25 percent during the 1968 to 1980 study period. Over 2,200 persons living in the county were available for work in 1980. Employment levels ranged from 1,620 workers in 1968 to 2,090 and 2,040 workers in 1979 and 1980, respectively.

The highest levels of unemployment in the county occurred between 1970 and 1975. In 1971, unemployment peaked at 230 persons, comprising 12.3 percent of the labor force. During 1978 and 1979, the unemployment rate dropped to 5.7 percent. In 1980, 160 county residents were without work as the unemployment rate rose to 7.3 percent.

Projected Employment

Section 3.2.3.1.2.1, presented earlier, showed projections of employment in Millard, Beaver, and Juab counties under trend-growth and high-growth conditions.

Major anticipated activities in Millard County include the Interimountain Power Project (IPP), Continental Lime cement plant, and Precision Built Modular Home Manufacturing. IPP is expected to employ 3,300 workers during its peak construction period in 1986. The Martin Marietta cement plant is planned for Juab County. These developments combined are projected to employ up to and about 1,100 workers in the long term.

Table 3.4.3.3.1-1 presents projected employment for the construction, trade, and service sectors in Millard County under both trend-growth and high-growth conditions. Construction employment in the county would be greatly affected by IPP and other non-M-X developments. Table 3.4.3.3.1-2 presents projected employment for the construction, trade, and services sectors in Juab County under the two growth scenarios. Juab County is not expected to experience as much large-scale growth as that anticipated under the high-growth baseline in Millard County. Beaver County sectoral employment projections appear in Table 3.4.1.3.1-1 in the Beryl section.

Income and Earnings (3.4.3.3.2)

Counties potentially affected by location of an operating base in the Delta area are Millard, Juab, and Beaver. Detailed baseline earnings data can be found in ETRs 2B, 2F, and 2H.

Millard County

Total earnings in Millard County amounted to \$31.3 million in 1979. Agriculture dominates the area's economy, with farm earnings accounting for the single largest component of total earnings in the economy (\$7.7 million in 1979).

Personal income per capita amounted to \$5,088 in 1979. However, income per capita is substantially less than state and U.S. rates. Earnings per worker follow a similar pattern with the exception of farm earnings per worker. Total earnings of \$8,231 (wage and salary disbursements) per worker fall below the state average of \$11,951.

County earnings data reflect a balanced economy despite the dominance of high agricultural earnings.

Juab County

Total earnings in Juab County amounted to \$20.1 million in 1979, up from \$13.3 million in 1974. Earnings per worker are lower than state averages: \$9,702 earnings per wage and salary worker in the county versus \$11,951 statewide (see Section 3.2.3.2). Only farm wage and salary earnings per worker compared favorably to state averages--\$5,808 in the county versus \$5,750 statewide. Manufacturing, government, and retail sectors accounted for the majority of earnings in the county in 1979. Personal income per capita amounted to approximately \$5,111 in 1979, significantly lower than the state average. Without

Table 3.4.3.3.1-1. Projected employment in construction, trade, and services in Millard County, trend-growth and high-growth baselines, 1982-94 (number of jobs).

Year	Trend-Growth			High-Growth		
	Construction	Trade	Services	Construction	Trade	Services
1982	51	587	262	741	697	354
1983	53	612	276	1,058	727	368
1984	56	639	293	2,372	869	483
1985	59	668	311	3,478	1,021	605
1986	61	683	320	3,018	1,019	596
1987	63	697	328	2,928	1,032	613
1988	64	712	337	2,382	1,019	597
1989	65	728	346	1,026	928	514
1990	67	743	357	123	879	478
1991	69	755	363	114	896	489
1992	69	765	370	115	907	497
1993	71	777	377	119	922	506
1994	73	789	384	120	934	520

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Note: Projections are presented to the nearest job only for convenience in review and do not imply this level of accuracy.

Source: University of Utah, Bureau of Economic and Business Research, 1980.

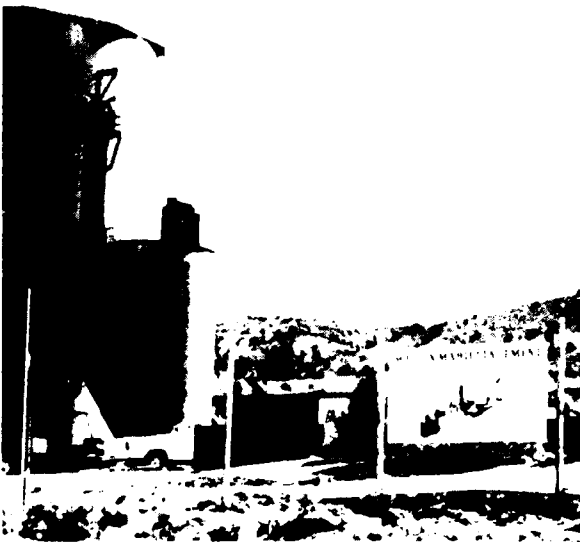
Table 3.4.3.3.1-2. Projected trend and high-growth employment in construction, trade, and services, Juab County, 1982-1994.

	Trend-Growth			High-Growth		
	Construction	Trade	Services	Construction	Trade	Services
1982	26	480	260	85	506	283
1983	27	502	276	49	564	333
1984	29	525	293	58	609	372
1985	30	550	313	67	654	412
1986	31	563	321	65	662	416
1987	32	575	330	66	672	425
1988	33	587	339	65	677	425
1989	33	600	348	57	668	412
1990	34	613	358	45	648	393
1991	35	624	366	47	660	401
1992	36	637	375	48	674	412
1993	36	648	383	50	685	420
1994	37	659	391	49	696	430

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Note: Projections are presented to the nearest job only for convenience in review and do not imply this level of accuracy.

Source: University of Utah, Bureau of Business Research, 1980.



Delta is undergoing economic diversification and rapid growth stimulated by energy development and construction of this new cement plant.

expansion within the basic sectors of the economy, residents of the county can expect continued low levels of income and earnings in the future.

Beaver County

Recent trends in income and earnings in Beaver County have been discussed in Sections 3.2.3.2 and 3.4.1.3.2.

Public Finance (3.4.3.3.3)

Delta

In Millard, Juab, and Beaver counties revenue contributions (by source) and public service expenditures (by category) fluctuate widely among the counties and municipalities. While other local governments exist in the county, data for only the largest are presented here as the intent is to indicate the extent of local ability to absorb growth. Table 3.4.3.3.3-1 presents recent historical revenue and expenditure information for Millard and Juab counties and the municipalities of Delta and Nephi. Fiscal data for Beaver County and its major cities can be found in Section 3.4.1.3.3 and in Tables 3.4.1.3.3-1, 3.4.1.3.3-2, and 3.4.1.3.3-3. Data tables for these counties are also presented in ETRs 2B, 2F, and 2H. Millard County relies heavily on intergovernmental transfers, while Delta obtains most of its revenues from local sources, such as property taxes, sales and use taxes and fines, fees, and charges. Millard County obtains 59.2 percent of its revenues from state and federal sources and 19.1 percent from property taxes. Conversely, intergovernmental revenues account for only 27.0 percent of total revenues in Delta. Property taxes contributed only 14.2 percent but when combined with other local revenues, the total contribution from local sources is 73 percent.

Expenditures are concentrated in public safety and public works in both Millard County and Delta. Delta spends 31 percent of its total outlays for public safety and Millard County 10.4 percent. Public works expenditures are 40.9 percent in Millard County, and considerably less, 24.0 percent, in Delta. Annual growth rates presented in Table 3.4.3.3.3-1 indicate that Millard County has experienced strong growth in revenues and expenditures during fiscal years 1975-79. Total revenues and expenditures have increased at an average annual rate of 27.0 percent and 23.9 percent respectively. Similar patterns are evident in the selected revenue and expenditure categories.

Revenue and expenditure trends in Juab County and the City of Nephi also are summarized in Table 3.4.3.3.3-1. Both depend heavily on intergovernmental transfers. Expenditures in Juab County and Nephi are concentrated in public safety and public works. Nephi contributes 22.7 percent of total expenditures to public safety and Juab County 17.2 percent. Public works expenditures account for 47 percent of total expenditures in Juab County, and 29 percent in Nephi. Similar growth rates for revenues of 18.3 percent and 17.5 percent have been observed in Juab County and Nephi, respectively. Juab County has experienced a 21.0 percent growth rate in total expenditures and Nephi only 12.3 percent.

School district revenues and expenditures are similar throughout the state of Utah. Instruction accounted for the largest single outlay at 44-51 percent of total expenditures. The remaining expenditures are primarily for administrative costs,

Table 3.4.3.3.3-1. Recent annual growth rates and percentage shares of specific revenues and expenditures by category, for Millard and Juab counties and selected communities.

	Total Revenues		Property Tax Revenues		Intergovernmental Transfers		Total Expenditures		Public Safety Expenditures	
	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Expenditures
Millard County ²	27.0	19.1	18.1	19.1	31.0	59.2	23.9	20.9	10.4	
Juab County ³	18.3	17.9	8.4	17.9	17.5	48.3	21.0	39.5	17.2	
Delta ⁴ (Millard County)	N/A	14.2	N/A	14.2	N/A	27.0	N/A	N/A	31.0	
Nephi ⁵ (Juab County)	17.5	N/A	N/A	N/A	34.6	17.6	12.3	51.6	22.7	
Millford ⁶ (Reaver County)	19.7	33.5	8.3	33.5	19.9	33.9	23.8	15.7	32.3	
Reaver City ⁷ (Reaver County)	1.0	25.5	4.0	25.5	-3.0	14.9	11.5	10.4	16.1	

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¹ Annual compound rate of change.

² Fiscal Year 1975-79. Expenditures calculated from FY 1976-79.

³ Fiscal Year 1976-79. Expenditures for FY 1976 do not include \$462,000 in health/sanitation/welfare costs.

⁴ Fiscal Year 1978-79 to FY 1979-80. Only two years of data create misleading, biased statistics not comparable with other information.

⁵ Fiscal Year 1976-77 to 1978-79. Property tax revenues cannot be determined from existing data.

⁶ Fiscal Year 1974-75 to FY 1978-79. Does not include transfer of \$1,035,000 in FY 1978-79.

⁷ Fiscal Year 1974-75 to FY 1978-79. Does not include "Transfers" and "Other" category.

Sources: See EIRs 2B, 2F and 2H.

Table 3.4.3.3.3-2. Recent annual growth rates and percentage shares of specific revenues and expenditures by category, for school districts in Millard and Juab counties.

	Total Revenue ¹		State Revenues		Local Revenues		Total Expenditures ²		Instruction Expenditures	
	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Expenditures	Annual Rate	Percent of Total Expenditures
Millard County School District	10.5	47.5	13.1	47.5	9.9	44.0	11.0	44.4	10.1	44.4
Juab County School District	24.9	53.9	28.8	53.9	19.8	34.0	16.8	51.5	11.8	51.5

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¹Does not include non-revenue sources (e.g., sale of school property and equipment).

²Does not include capital outlay expenditures.

Sources: See ETRs 2B, 2F and 2H.

Table 3.4.3.3.3-3. Valuation, indebtedness limitations, and reserve bonding capacities, 1981.

Jurisdiction	Assessed Value	Indebted- Ness Limitation	Outstanding G.O. Bonds	Reserve Bonding Capacity
Millard County	37,443,435	2,995,474	0	2,995,474
Millard County School District	37,443,435	5,990,950	3,073,000 ¹	2,917,950
Delta City	3,432,579	1,647,638	0	1,647,638
Juab County	21,632,510	1,730,600	0	1,730,600
Juab County School District	19,076,917	3,052,306	1,640,000 ¹	1,412,306
Nephi	6,244,187	2,997,210	1,300,000	1,697,000

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¹ School Year 1979-80.

Source: Utah Foundation, 1981, Statistical Review of Government in Utah, 1981 Edition.

debt service charges, insurance, pension payments, and maintenance and operation of the physical plant. Revenue sources for the school districts are principally from state (Uniform School Fund) and local contributions. In both school districts, revenue comes primarily from state sources ranging from 47.3 percent in Millard County School District to 53 percent in Juab County school district (see Table 3.4.3.3.3-2). Juab County school district experienced significantly higher annual rates of growth of 24.9 percent for revenues and 16.8 percent for expenditures during FY 1974-75 to FY 1978-79.

Fiscal structures in Millard and Juab counties are less than adequate to support more than low to moderate growth. Due to relatively small tax bases and reserved bonding capacities of the jurisdictions (Table 3.4.3.3.3-3), long-term financing of major capital improvement projects is not feasible. For example, reserves are limited to \$3.0 million in Millard County.

Population and Communities (3.4.3.3.4)

The area of analysis (AOA) for the proposed operating base near Delta, which would be located in a remote rural area of central Millard County about 40 mi west of the town of Delta, includes Millard, Juab, and Beaver counties. The extent of the AOA is determined by the maximum daily commuting zone for direct project employees who would have work locations on the OB. Although the three counties experienced moderate population growth during the past decade, they remain thinly populated, as may be seen from Table 3.2.3.4-3, with densities of less than two persons per sq mi. Detailed baseline information for Beaver County is presented in Section 3.4.5.3.4.

Millard County

The number of residents in Millard County increased by 28.4 percent during the last decade to 8,970 persons in 1980 (see Table 3.4.3.3.4-1). The 1,982 persons added to the population represents an annual growth rate of 2.5 percent, compared to a 3.3 percent growth rate in the state as a whole. The county remains sparsely settled with a density of 1.3 persons per sq mi in 1980. Delta and Fillmore, which have populations of 1,930 and 2,083, respectively, are the two largest communities in the county, although there are a number of smaller incorporated places with fewer than 500 residents, including Hinckley, Leamington, Lynndyl, Kanosh, Meadow, Holden, Oak City, and Scipio. Population in the county is racially and ethnically homogeneous, with Native Americans comprising 1.5 percent and persons of Spanish origin comprising 1.8 percent of the residents. Average household size is slightly larger than for the state as a whole, with 3.28 persons per household in 1980.

Juab County

Located just north of Millard County, Juab had a population of 5,530 in 1980, virtually all of which resided in the extreme eastern edge of the county. About 60 percent of the county's population was in Nephi, which had 3,285 residents in 1980. Other communities include Eureka, Levan, and Mona. The county added about 950 residents during the past decade, for an annual growth of 1.9 percent, but it remains sparsely settled with an average density of 1.6 persons per sq mi in 1980.

Table 3.4.3.3.4-1. Population and population change 1970-1980 by county and community within the Delta OB area of analysis.

County/Community	Population		Change 1970-1980		
	1980	1970	Number	Percent	Annual Rate ¹
Beaver County, Utah	4,378	3,800	578	15.2	1.4
Beaver ccd ²	2,298	-	-	-	-
Beaver city	1,792	1,453	339	23.3	2.1
Milford/Minersville ccd	2,080	-	-	-	-
Milford city	1,293	1,304	-11	-0.8	-0.1
Minersville town	552	448	104	23.3	2.1
Juab County, Utah	5,530	4,574	956	20.9	1.9
Eureka ccd	763	884	-121	-13.7	-1.5
Eureka city	670	753	-83	-11.0	-1.2
Nephi ccd	4,648	3,554	1,094	30.8	2.7
Levan town	453	376	77	20.5	1.9
Mona town	536	309	227	73.5	5.7
Nephi city	3,285	2,699	586	21.7	2.0
Millard County, Utah	8,970	6,988	1,982	28.4	2.5
Delta ccd	4,394	-	-	-	-
Delta city	1,930	1,610	320	19.9	1.8
Hinckley town	464	400	64	16.0	1.5
Leamington town	113	112	1	0.9	0.1
Lynndyl town	90	111	-21	-18.9	-2.1
Fillmore ccd	3,254	-	-	-	-
Fillmore city	2,083	1,411	672	47.6	4.0
Kanosh town	435	319	116	36.4	3.2
Meadow town	265	238	27	11.3	1.1
Garrison/Sevier Lake ccd	223	-	-	-	-
Scipio ccd	1,099	912	187	20.5	1.9
Holden town	364	351	13	3.7	0.4
Oak City town	389	278	111	39.9	3.4
Scipio town	257	264	-7	-2.7	-0.3

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¹ Annual compound rate of change.

² Census county division.

Source: U.S. Bureau of the Census. 3-561

Housing (3.4.3.3.5)

Millard County registered an average annual rate of change of 3.0 percent in the number of housing units between 1970 and 1980. This moderate rate of change also occurred in the two major communities: Delta (2.4 percent per year) and Fillmore (3.6 percent per year). In 1980, the ten communities of the county contained 71 percent of the total county housing stock, down only slightly from 74 percent in 1970 (U.S. Department of Commerce, Bureau of the Census, 1981).

Single unit structures make up 82 percent of total units at the county level and mobile homes make up 17 percent, with 38 percent of these located outside the communities. Fillmore has the highest proportion (21 percent) of its housing in mobile homes of any community in the county (M-X Missile Policy Board, 1981).

It is estimated that there exist 511 vacant housing units in the county, which amounts to a vacancy rate of 15.5 percent. Of these vacant units, 316 (62 percent) are located in the communities (Hammer, Siler, George Associates, 1981).

Over the ten-year period of 1970-1979, an annual average of 28 housing unit permits were issued each year, almost all of which have been for single unit structures (U.S. Department of the Commerce, Bureau of the Census, 1970 to 1979, inclusive).

Millard County is projected to experience an average annual rate of growth of its housing stock of 2.2 percent over the period 1982-1994 under trend-growth conditions. This equates to an increase of 934 units from a base in 1982 of 3,076 units. Under high-growth conditions the increase amounts to 1,154 units from a base of 3,809 units in 1982 with an average annual rate of growth over the period 1982-1994 of 2.2 percent (refer to Table 3.2.3.4.2-1). These rates of growth compare with 2.7 and 2.8 percent, respectively, for trend- and high-growth projections for the deployment regions.

Community Infrastructure (3.4.3.3.6)

Education

The Millard County School District, with a 1980-81 enrollment of 2,319 pupils, operates three elementary schools, one junior high, and two senior high schools. Approximately 96 teachers are employed by the school district. Enrollment levels are increasing now due to the Intermountain Power Project. The capacity of the school system is almost completely utilized in most grade levels, with several portable classrooms already being used to accommodate some students (Millard County School District, 1981).

Health Care

The West Millard Hospital in Delta contains 36 beds (16 for acute-care and 20 for long-term care). Acute-care beds have an average daily occupancy rate of 31 percent, but long-term beds have an occupancy rate of 100 percent. A new hospital is planned for Millard County which would contain 25 acute and 20 long-term beds. Fillmore has a hospital with 22 acute-care beds and several extended-care beds, and is utilized at 44 percent. There is also a primary care clinic in Fillmore. The Central

Utah Mental Health Center operates in Delta and Fillmore. County health care personnel include 5 physicians, 21 nurses, 4 dentists, and 2 mental health workers. Emergency medical services consist of 29 emergency medical technicians who provide ambulance service from Delta to Payson, Provo, and Salt Lake City (West Millard Hospital and Fillmore Hospital, 1981).

Police Protection

County-wide law enforcement is provided by the Millard County Sheriff's office which employs five deputies, each equipped with a patrol car. The county jail located in Fillmore is designed to hold eight people. The Delta municipal police force employs five officers, two patrol cars and has no jail or holding facilities. Fillmore has four officers and two patrol cars (M-X Missile Policy Board, 1981).

Fire Protection

The Delta Fire Department serves Delta, and the western part of Millard County. The department consists of 25 volunteers, and four trucks with pumping capacities of 1,000 gpm, 750 gpm, 500 gpm and 250 gpm. The fire rating is 7 in Delta City and 10 in the west part of the county. Fillmore has 35 volunteers and four trucks with pumping capacities of 1,250 gpm, 750 gpm, and two trucks with a 400 gpm capacity. The fire rating is 7. The communities of Scipio, Meadow, Kanosh and Holden also have volunteer fire departments (M-X Missile Policy Board, 1981).

Traffic and Transportation (3.4.3.3.7)

The proposed operating base site is approximately 20 mi west of Delta, Utah, along U.S. 50. A map of the existing road network around Delta is shown in Figure 3.4.3.3-1. Major roadways in the area are U.S. Highway 6 and 50, State Routes 50, 100, and 257, and Interstate Highway 15. Traffic volumes for 1978 are also shown in Figure 3.4.3.3-1 for major routes in the area.

Delta is served by the Union Pacific Railroad which connects Salt Lake City, Utah and Las Vegas, Nevada. Limited commercial airline service is available at Delta.

Energy (3.4.3.3.8)

Delta, Utah has no natural gas service. Although no plans exist for extension of service to the area, if such service were to be provided the supplier would be Mountain Fuel Supply (MFS), Salt Lake City. Pacific Gas Transmission (PGT), a subsidiary of Pacific Gas and Electric, San Francisco, has proposed to build a 36-in. high pressure natural gas pipeline from southwest Wyoming, passing east of Provo, Utah near Strawberry Reservoir, and by-passing by approximately 17 mi northwest of Cedar City, Utah, through southern Nevada, to southern California. Delta is located approximately 26 mi west of the proposed pipeline route.

Home energy requirements are supplied by bottled gas, fuel oil and electricity. The fuels are trucked in from Las Vegas, Nevada, and Salt Lake City, Utah.

Electrical energy to Delta is supplied by Utah Power and Light Company via two 46 kV subtransmission lines.

Land Ownership (3.4.3.3.9)

The suitability zone for the proposed Delta OB complex is located about ten mi southwest of Delta, Utah in an area 80 percent of which is under the control of the BLM. The remaining 20 percent is divided between state trust and privately owned land.

Land Use (3.4.3.3.10)Urban Land Use

The location of an OB near Delta would impact urban land uses primarily in Millard County. Some spillover effects would be felt in Juab County. Urban land available for development in each of these counties and their selected communities is discussed below. ETR-36, "Urban Planning and Growth," provides more information on the land use planning activities in the two counties.

Millard County

Millard County has historically been a slow-growing county with a minimum of land use and development controls. The Intermountain Power Project (IPP) and other projects in the Millard County area have resulted in additional planning activities by several planning organizations. The Six County Commissioners Organization, the regional planning commission for Millard County and its communities, presently conducts A-95 reviews, land use and impact studies, and provides local planning assistance. Due to the anticipated growth, the organization's staff has recently completed an evaluation of the plans, ordinances, and codes, and an inventory of the infrastructure facilities in the county. Millard County and the ten incorporated communities in the county established Millard Intergovernmental Cooperative Association (MICA) in order to coordinate planning activities needed as a result of IPP. MICA, in conjunction with the county, has contracted for the preparation or revision of the master plans, zoning ordinances, and subdivision ordinances of the county and incorporated communities. While the county adopted its first master plan in 1970, these are the first master plans that have been prepared for the remainder of the jurisdictions. Table 3.4.3.3.10-1 provides information on the status of the plans and ordinances for the county and associated communities. The two largest communities, Delta and Fillmore, plus the county have had zoning, subdivision, and mobile home ordinances for several years, while seven smaller towns have not.

The Delta OB site, about 23 mi southwest of Delta, places Delta and Hinckley in the position of receiving major pressures for urban development from the OB activities. Delta and Hinckley are also expected to be subject to high growth pressures from the construction of the IPP plant ten mi to the north. The total areas of Delta and Hinckley, according to Table 3.4.3.3.10-2, are 800 acres and almost 3,200 acres respectively, although almost 3,000 acres in Hinckley are agricultural land. Fillmore, the county seat of Millard County, has the largest amount of land in urban uses, about 980 acres, while the remaining towns in Millard County have existing land acreages as noted in Table 3.4.3.3.10-2. Kanosh, Meadow, and Scipio are more distant from the OB site than Fillmore. Oak City, Leamington, Lynndyl, and Holden are communities with approximately the same amount of urban development (100-150 acres) and are between 30 and 50 mi from the OB site.

Table 3.4.3.3.10-1. Status of adoption of plans and ordinances in Millard and Juab Counties, Utah.

Jurisdiction	Master Plan		Zoning Ordinance		Subdivision Ordinance	
	Date Adopted	Notes (Expected Date of Completion)	Date Adopted	Notes (Expected Date of Completion)	Date Adopted	Notes (Expected Date of Completion)
Juab County	No plan	Under development (Fall 1981)	1977	Under revision (Spring 1982)	1977	Under revision (Spring 1982)
Eureka	No plan	Under development (Fall 1981)	No ordinance	Under development (Spring 1982)	No ordinance	Under development (Spring 1982)
Levan	No plan	Under development (Fall 1981)	No ordinance	Under development (Spring 1982)	No ordinance	Under development (Spring 1982)
Mona	No plan	Under development (Fall 1981)	No ordinance	Under development (Spring 1982)	1974	Under revision (Spring 1982)
Nephi	No plan	Under development (Fall 1981)	1979	Under revision (Spring 1982)	1980	Under revision (Spring 1982)
Millard County	1970	Under revision (1981)	1969	Under revision (1981)	1970	Under revision (1981)
Delta	1981		ca 1970	Under revision (1981)	ca 1972	Under revision (1981)
Elmore	1981		1974	Under revision (1981)	1974	Under revision (1981)
Hinckley	1981		No ordinance	Under development (1981)	1981	
Holden	No plan	Under development (1981)	No ordinance	Under development (1981)	No ordinance	Under development (1981)
Kanosh	No plan	Under development (1981)	No ordinance	Under development (1981)	No ordinance	Under development (1981)
Learnington	1981	Under development (1981)	No ordinance	Under development (1981)	No ordinance	Under development (1981)
Lynndyl	No plan	Under development (1981)	1981		No ordinance	Under development (1981)
Meadow	No plan	Under development (1981)	No ordinance	Under development (1981)	No ordinance	Under development (1981)
Oak City	1981		No ordinance	Under development (1981)	No ordinance	Under development (1981)
Scipio	No plan	Under development (1981)	No ordinance	Under development (1981)	No ordinance	Under development (1981)

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N/A = Not Available

Source: Telephone communication with local officials January-August 1981.

Table 3.4.3.3.10-2. Existing land use, Millard County communities.

	Residential	Commercial	Industrial	Public/Quasi-Public	Streets	Developed Land Subtotal	Agricultural	Vacant	Total
Delta									
Acres	267	32	21	59	241	620	16	164	800
Percent of land:									
Total	33.4	4.0	2.6	7.4	30.1	77.5	2.0	20.5	
Developed	43.1	5.2	3.4	9.5	38.9	100	-	-	
Fillmore									
Acres	387	61	141	82	310	981	134	1,771	2,886
Percent of land:									
Total	13.4	2.1	4.9	2.8	10.7	34.0	4.6	61.4	
Developed	39.4	6.2	14.4	8.4	31.6	100	-	-	
Hinckley									
Acres	75	1	2	30	99	207	2,961	12	3,180
Percent of land:									
Total	2.4	0	0	0.9	3.1	6.5	95.1	0.4	
Developed	36.2	0.5	1.0	14.5	47.8	100	-	-	
Holden									
Acres	62	2	1	8	53	126	161	84	371
Percent of land:									
Total	16.7	0.5	0.3	2.2	14.3	34.0	43.4	22.6	
Developed	49.2	1.6	0.8	6.3	42.1	100	-	-	
Kanosh									
Acres	98	4	0	12	107	221	191	68	480
Percent of land:									
Total	20.4	0.8	-	2.5	22.3	46.0	39.8	14.2	
Developed	44.4	1.8	-	5.4	48.4	100	-	-	
Leamington									
Acres	12	1	1	5	82	101	582	299	982
Percent of land:									
Total	1.2	0.1	0.1	0.5	8.4	10.3	59.2	30.5	
Developed	11.9	0.9	0.9	5.1	81.2	100	-	-	
Lyndyl									
Acres	21	1	1	3	123	149	491	190	830
Percent of land:									
Total	3.0	-	-	-	15.0	18.0	59.0	23.0	
Developed	14.0	1.0	1.0	2.0	82.0	100	-	-	
Meadow									
Acres	48	2	4	9	44	107	136	39	282
Percent of land:									
Total	17.0	0.7	1.5	3.2	15.6	38.0	48.2	13.8	
Developed	44.9	1.9	3.7	8.4	41.1	100	-	-	
Oak City									
Acres	48	1	1	7	78	135	200	2	337
Percent of land:									
Total	14.2	0.3	0.3	2.1	23.1	40.0	59.4	0.6	
Developed	35.5	0.7	0.7	5.2	57.7	100	-	-	
Scripio									
Acres	14	4	7	11	60	96	410	90	596
Percent of land:									
Total	2.3	0.7	1.2	1.8	10.1	16.1	68.8	15.1	
Developed	14.6	4.2	7.3	11.4	62.5	100	-	-	
Millard County Total									
Acres	1,032	109	179	226	1,197	2,743	5,282	2,719	10,744
Percent of land:									
Total	9.6	1.0	1.7	2.1	11.1	25.5	49.2	25.3	
Developed	37.6	4.0	6.5	8.2	43.6	100	-	-	

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Source: Paul Nelson and Associates, 1981.

Juab County

In view of the construction of IPP, the county and the four incorporated communities of Nephi, Eureka, Mona, and Levan have contracted for the preparation of master plans and zoning, subdivision, and mobile home ordinances. The current status of the county's master plans and ordinances is presented in Table 3.4.3.3.10-1. The consultant will prepare the plans and ordinances as noted in the table. The current county zoning ordinance, adopted in 1977, permits urban uses in agricultural areas and is poorly suited toward guiding the large amounts of growth that could be expected from M-X activities.

The City of Nephi is the largest community in the county, with almost 1,300 acres of land inside the city limits. The proportions of vacant and agricultural land in the community according to Table 3.4.3.3.10-3 are 20 percent, fairly low relative to most of the Utah communities in the DDA. Nephi also has approximately 700 acres of residentially developed land, which is over half of the residential land in the county. Eureka is the second largest community in terms of land developed for urban use, although the town of Mona, with over 550 acres of agricultural and vacant land, is second largest in terms of total land area.

Agriculture

No irrigated cropland is located within the proposed OB suitability zone near Delta, Utah. Considerable irrigated agriculture, however, is located around the city of Delta, which is about seven mi to the northeast of the closest point of the suitability zone. (see Figure 4.3.3.11-5).

Grazing

The suitability zone for the Delta OB intersects 2 allotments and about 4,300 AUMs. Four operators have grazing permits on these allotments.

Recreation

Parklands

Many of the nearby parklands within easy access (approximately 50 mi) of the Delta/Fillmore area are to the east in the Pavano Range and Wasatch Plateau. The National Forest Service and Utah Division of Parks and Recreation administer the vast majority of these parklands. Portions of the Fishlake, Uintah, and Wasatch National Forests are just to the east of the Delta/Fillmore area.

One snowplay and snowmobile area (Salena Canyon and Skyline Drive) is easily accessible to the Fillmore and Delta communities. Ten campgrounds in National Forest lands and three campgrounds administered by the BLM are within easy access of both Fillmore and Delta. In addition to two developed campgrounds and a picnic area, the Little Sahara Recreation Area (BLM-managed) provides opportunities for dunebuggy and motorcycle riding and racing (Table 3.4.3.3.10-4).

Table 3.4.3.3.10-3. Existing land use - Juab County, Utah.

	Eureka		Levan		Mona		Nephi		Unincorporated Areas		Juab County Total	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Residential	287.0	51	215.7	46	97.6	13	702.4	55	71.3	0	1,374	0
Commercial	36.0	6	8.5	2	3.0	0	43.6	3	4.9	0	96	0
Industrial	35.0	6	3.5	1	0	0	10.0	1	39.5	0	88	0
Streets	49.0	9	67.2	14	62.3	9	217.0	17	6,726.5	2	7,122	2
Public	12.0	2	21.5	5	2.5	0	45.0	4	20.0	0	101	0
Developed land subtotal	419.0	75	316.4	67	165.4	23	1,018.0	80	6,862.2	2	8,781	2
Agriculture/vacant	141.2	25	157.2	33	557.8	77	262.0	20	384,017.8	98	385,136	98
Total	560.2	100	473.6	100	723.2	100	1,280.0	100	390,800.0	0	393,917	100

T5356/9-9-81

Source: Six County Commissioners Organization, 1979, "Six County Development Plan."

Table 3.4.3.3.10-4.

Developed recreation sites on federal lands in the vicinity of Delta/Fillmore.

Site Name	Activities	Units	+Miles From Delta/Fillmore
Fishlake National Forest			
Gooseberry	Camping	4 sites	-/50+
	Fishing	--	
	Hunting	--	
Castle Rock	Camping	9 sites	-/40
	Fishing	--	
Shell Oil Site	Camping	3 sites	-/15
	Fishing	--	
Uinta National Forest			
Little Valley	Camping	7 sites	50+/-
	Fishing	--	
	Hunting	--	
Little Cottonwood	Camping	3 sites	50+/-
	Fishing	--	
	Hunting	--	
Ponderosa	Camping	28 sites	50+/-
	Fishing	--	
	Hunting	--	
Chicken Creek	Camping	11 sites	50+/50+
	Fishing	--	
	Hunting	--	
Fishlake National Forest			
Maple Grove	Camping	9 sites	50+/40
	Fishing	--	
	Hunting	--	
Maple Hollow	Camping	14 sites	35/15
	Hunting	--	
Oak Creek	Camping	13 sites	20/40
	Hunting	--	
	Fishing	--	
BLM			
Maple Creek	Camping	--	35/15
Little Sahara Recreation Area	Camping Dune Bug & ORV Rec.	255 sites 85 sq. mi.	35/50+

T3806/9-29-81/F

Source: Utah Travel Council.

There is one state recreation area, Yuba Lake, within 50 mi of Delta and 40 mi of Fillmore. Yuba Lake and Gunnison Bend Reservoir, just west of Delta, are the only water-based recreation sites in the area other than hunting at the Clear Lake and Topaz Waterfowl Management Areas. Yuba Lake has camping (18 sites), boating, swimming (0.6 acres of beach), and waterskiing (10,700 surface acres of water) (Utah Outdoor Recreation Agency, 1976).

Snow-Related Recreational Facilities

Except for the two areas of snowplay and snowmobile trails identified, Salina Valley and Skyline Drive, there are very few developed snow-related recreation sites in the area. The nearest ski resort is Mt. Holley to the south, approximately 70 mi from Fillmore. A number of ski resorts and other snow-based recreation sites are located in the Wasatch Range, east of Provo, and Salt Lake City, north of the proposed OB deployment area.

Water-Related Recreational Facilities

As noted above, there are two designated water-based recreation sites, Yuba Lake and Gunnison Bend Reservoir, within 50 mi of Delta/Fillmore. Further north, there are developed water-based recreation sites around Utah Lake and the Great Salt Lake. River-rafting, kayaking, canoeing, and fishing may be enjoyed on some of the larger mountain creeks or streams. Waterfowl hunting is available along the Sevier River and various reservoirs near Delta and within the Clear Lake and Topaz Waterfowl Management Areas.

ORV and Other Forms of Dispersed Recreation

The largest developed ORV park in this region is the Little Sahara Recreation Area of the BLM, with 85 sq mi. Dunebuggy and other ORV enthusiasts typically come from as far away as Salt Lake City to enjoy this area. The area just north of the Little Sahara is also the site of the Cherry Creek national motorcycle races. Use of ORVs in recreational pursuits occurs throughout the entire region, the most concentrated use being in and around the Little Sahara Complex, Little Valley near Yuba Lake State Recreation Area, and Whirlwind Valley (BLM, March 1980).

Vehicle use to engage in other recreational pursuits such as rockhounding, driving for pleasure, or hunting may be expected to increase on the BLM and Forest Service lands in the vicinity of Delta and Fillmore. The House Range and Keg Mountains already receive a good deal of this type of activity (BLM, 1980). The Gunnison Bend reservoir near Delta and at Clear Lake State Waterfowl Management Area and Topaz Waterfowl Management Area provide good waterfowl and upland game hunting.

Recreation Within the Suitability Zone

No designated recreation sites are located within the suitability zone of the proposed OB. Because this area is mostly under public ownership, it is used for dispersed recreation, collecting, and off-road vehicle use. Some of the best pheasant, dove, and chukar hunting in Utah exists in this area, and the Sevier River with its reservoirs provides warm-water fishing.

Mining

No mining sites are located on land designated for the proposed OB.

Native Americans (3.4.3.3.11)

Native American Cultural Resources (3.4.3.3.11.1)

The Delta area has potential cultural significance for three Utah Indian tribal groups: the Goshute Shoshone, Western Ute, and Southern Paiute. The nearest Native American community is the Kanosh Reservation, 35 miles southeast of the OB vicinity. Portions of the Sevier Desert north and west of the Delta area lie in the southeastern territory of the Goshutes, who reside at the Skull Valley and Goshute reservations. The full extent of Goshute cultural resources in this area has not yet been determined. However, initial field studies conducted during the summer of 1980 documented sacred sites and hunting and gathering areas in the Deep Creek Range, the Cedar Mountains, and Fish Creek National Wildlife Refuge. Many of these are still used by present-day Native Americans.

The Sevier Desert contains 23 recorded traditional habitation sites, and 141 springs. An intensive survey of this large area has not been conducted. Rock art sites are documented for the Sheeprock and Simpson mountains in the northern portion of the unit, and for lava flow areas south of Delta. In addition, burial grounds occur in the Pahvant and Canyon ranges east of Delta. Two branches of Western Utes, the Timpanogots and Pahvants, inhabited the Sevier Desert unit from prehistoric times until the 1850s. Timpanogots' villages are documented in Tintic Valley during the 19th century. The Pahvant inhabited permanent settlements on the Sevier River, Beaver River, and on the adjacent flank of the Pahvant Mountains. Winter villages corresponding to major Pahvant divisions were located at Lynndyl, Deseret, Black Rock, Kanosh, Holden, and Scipio.

Contemporary Southern Paiutes moved into the Sevier Desert basin after the forced emigration of the Utes to the Uintah Reservation in the 1850s and are now dominant in the area. Cultural resource data on the Utah Southern Paiutes is generally incomplete. However, the current use of sacred sites and hunting and gathering areas in the Pahvant Range has been documented for the Kanosh Band. Additional cultural resource data for a Tier II analysis are being gathered in field studies at reservations and colonies in the area.

Native American Land/Water Resources (3.4.3.3.11.2)

A study is currently in progress which addresses land use economics development plans of the Paiute Indian Tribe of Utah. However, estimates of impacts resulting from OB siting at Delta cannot be made with precision until the tribe determines the location of their 15,000 acre land withdrawal.

Socioeconomic Characteristics (3.4.3.3.11.3)

Socioeconomic characteristics for Native Americans in the vicinity of the Delta OB are the same as those described for the Beryl OB in Section 3.4.1.3.11.3.

Archaeological and Historical Resources (3.4.3.3.12)

The southeastern half of the Delta vicinity zone encompasses a tributary, and the sand dunes and extensive slough, lake and marsh community habitats associated with the Sevier River. The available lacustrine resources probably resulted in frequent visits, or even permanent or semi-permanent occupation by prehistoric peoples. The 1980 100 sq mi regional survey included the valleys of Sevier Desert and Sevier Lake, and documented the presence of a residential camp, and numerous field camps and procurement sites in this area. Sites include Archaic, Sevier/Fremont, Shoshone, and Euro-American materials. The Paleo-Indian site 42 MD 300, a National Register site, is located just east of the vicinity zone and indicates that this area has been utilized for 10,000 years or more. Paleo-Indian sites and sites associated with lacustrine use are poorly understood, and many would be eligible for National Register nomination. In contrast, the rest of the zone is void of important resources that would have attracted prehistoric habitation.

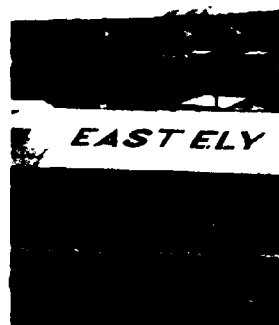
The survey mentioned above found that sites away from the riverine zone consist mostly of light scatters of lithic debris. These probably resulted from short term hunting and gathering activities and have little depth. While these small sites have only light concentrations of artifacts, they are important in understanding prehistoric use of the local environment.

Paleontology

The Delta OB siting area is located on alluvial valleyfill in an area that at one time was inundated by Lake Bonneville. Lake Bonneville was a large lake that covered much of the Utah Basin and Range during the late Pleistocene, up to about 10,000 years ago. Important vertebrate fossils have been found in scattered locations in the Bonneville sediments.



The Sevier Desert North West of Delta lies in the southeastern territory of the Goshutes Shoshone. Field studies for this FEIS documented sacred sites and hunting and gathering areas in the vicinity of this photograph.



Ely



ELY

Introduction

The area of analysis (AOA) for the Ely operating base option includes White Pine County. The AOA is located in the north central section of the designated region of influence (ROI) as shown in Figure 3.4.4-1. Ely, McGill, and Ruth are the major settlements in the AOA. This section and Chapter 4 detail important environmental characteristics of Ely and vicinity and the proposed base site, respectively.

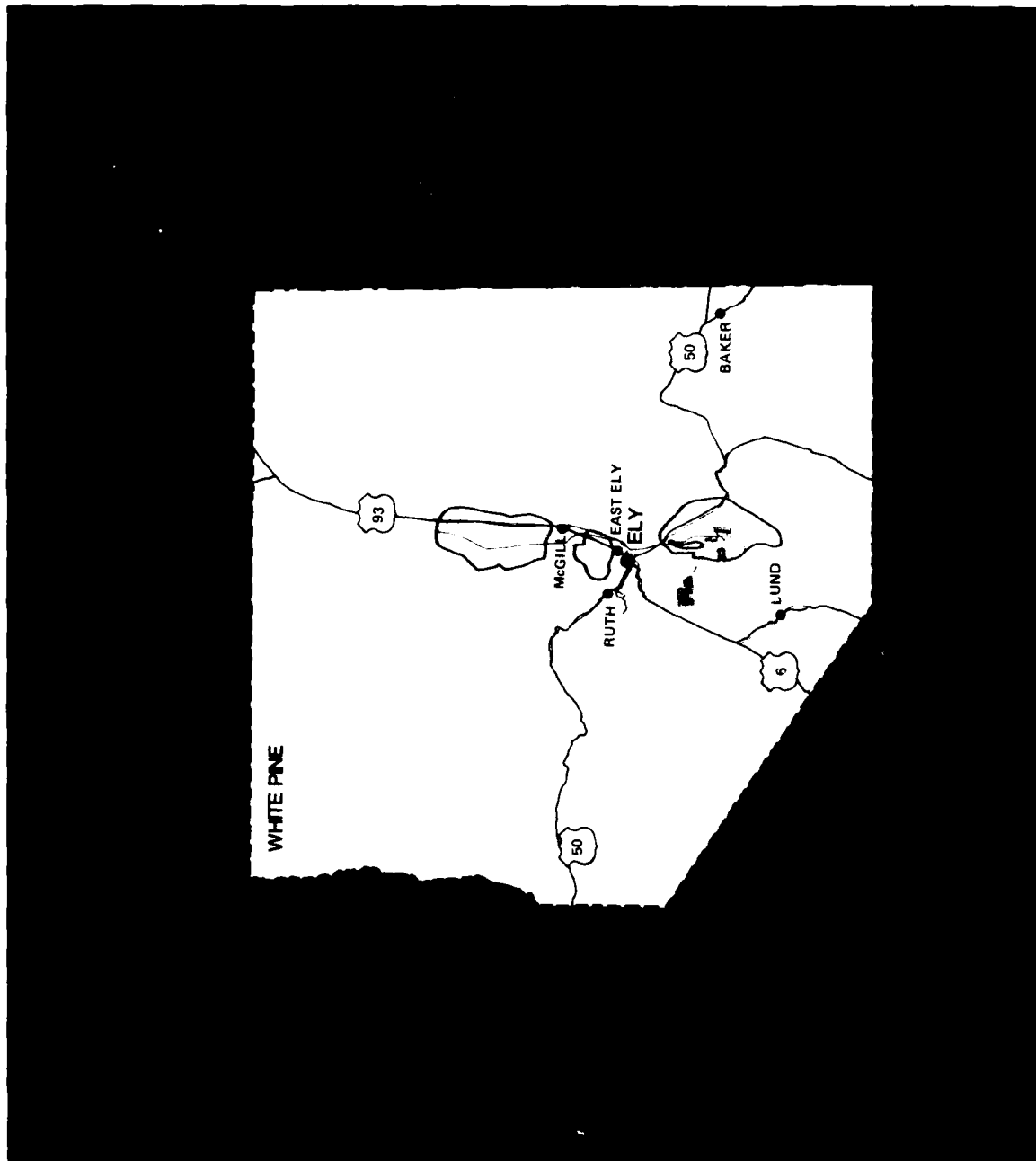
Once a part of Lander County, White Pine County was organized separately on April 1, 1869. This was a result of the rapid population growth in the Hamilton area due to a rich mining discovery on Treasure Hill. Hamilton became the county seat in the same year, but by 1885, the town had declined to the point becoming uneconomical to work--the eventual fate of several other towns in the county.

Around 1906, the Kennecott Copper Corporation began mining operations in Ely and has since been the major supporting industry for Ely, McGill, and Ruth. Until recently, Ely was one of the largest copper producing areas in the county.

Although the tourist-related sector is the most important as regards personal income in the state of Nevada, it is the mining and related manufacturing sector which is of primary importance in White Pine County. While White Pine County contributes only about 1 percent to total state income, it was the source of over 20 percent of income produced from the mining sector statewide. This income originates from the copper mining industry of which the Kennecott Copper Corporation is the major producer in White Pine County.

Quality of Life, White Pine County, Nevada (3.4.4.1)

A brief review of quality of life indicators for White Pine County shows it to be a fairly typical rural Nevada county with a few clear distinctions. While Nevada as a whole has been growing rapidly for the last decade, White Pine County and Ely have not shared in this growth, and have experienced a 0.2 population decline



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Figure 3.4.4-1. Area of analysis (AOA), Ely.

(Table 3.4.2.1-1). Along with a decline in their labor force, they have experienced considerable out-migration in recent years because of mine closure. Housing values are well below the state average. The percent of dwellings with more than one person per room are above the state average. In the area of health, White Pine County is slightly below the state and national averages on most indicators, and well below average in its number of physicians, having only 0.3/1,000 population compared to the national average of 1.7/1,000 population. Public safety factors show White Pine County to be similar to the national average for police officers/1,000 population and crime rates, whereas the state statistics, which are dominated by the two urban areas, show very high crime rates. Social stress indicators reveal its divorce rate to be comparatively high by national averages, but low in comparison to the state figure (11.2 compared to 17.9/1,000 population, respectively). The alcoholism rate of rural Nevada counties, at 38.3/1,000 population, is very near the national average of 42.0/1,000, while it is well below the state average of 67.7/1,000 population. Indicators for the education component show White Pine County to be very similar to the state median school years completed of 12.1, slightly below the state average of 12.6 (Table 3.4.2.1-1).

The mining industry is the dominant employer in White Pine County. Thus its population and employment statistics show recurrent boom and bust cycles tied to fluctuating mineral prices. Currently, it is in a bust cycle with high unemployment and a recent loss of population and employment due to Kennecott Copper being shut down. These circumstances are strongly reflected in the attitudes held by local residents.

Open spaces, relaxed lifestyles, and clean air are the three values most cited by White Pine County residents as to what it is that they like about living in Nevada (Table 3.4.2.1-2). Over 80 percent implied a willingness to alter their life style by riding a bus to work and having increased population. Changes in life style which are least acceptable to White Pine County residents include reduced access to the out-of-doors, hunting, and fishing, and an increase in federal regulations (Table 3.4.2.1-3). White Pine residents further cite unemployment/economic development, federal government regulation, and lack of industrial and economic diversity as the most important problems facing their area (Table 3.4.2.1-4). In addition, 86 percent felt that growth (more people) would be beneficial to their community, 73 percent were not pleased with their lack of growth over the last few years (Table 3.4.2.1-5), and 86 percent felt that it was "of major importance" to develop sources of employment other than gaming. Their preferences for future growth include expansion in mining, power plants, and agriculture. Other types of economic activities are ranked much lower in preference by White Pine citizens (Table 3.4.2.1-6).

A majority of the White Pine County residents who returned questionnaires preferred that public spending over the next twenty years remain the same for arts and culture, fire protection, services to economically disadvantaged and handicapped. However, they were willing to have increased spending for streets and highways, transportation other than highways, primary and secondary education, services to senior citizens, and colleges and universities. Support for parks and recreation and land use planning was closely divided between those preferring to spend more and those satisfied with current levels of expenditures. Further information relating to public services was sought in questions about the adequacy of selected services. In White Pine County public transit was viewed as inadequate

while health services were perceived as adequate by a majority of respondents. In the area of government and planning, land use planning was agreeable to the majority (Governor's Commission, 1980).

In summary, Ely and White Pine counties are rural Nevada areas which have suffered severe economic and population decline from the mining industry. This experience has disposed them to look favorably at projects that could reverse the decline experienced during the 1970s. A majority of the residents favor further economic and industrial diversification and moderate population growth, and value their open space, and quiet. Anything that would increase federal regulations or reduce access to the out-of-door, especially for fishing and hunting would be unacceptable. The assumption can be made that most of the residents remaining in the Ely area have a deep attachment to their lifestyle and community.

The Governor's Commission survey reveals that 60 percent of those returning the questionnaire had lived there for over 26 years. A survey done for the White Pine Power Project corroborates this long and strong attachment to the area. The study shows that residents are quite satisfied, indicating they live in the "best community they could live in." Over two-thirds of those surveyed had lived there for more than 20 years as well. The residents are interested in bringing in projects that generate economic development, but they want this growth to be carefully integrated into the old community and of a scale such that project-induced growth does not overwhelm the community (Bureau of Business and Economic Research, 1979). Quoting from the survey summary, "residents within the study areas generally perceive their social well-being and quality of life to be positive. The major exception, of course, is directly related to the community's desperate need for commercial/industrial diversification."

Natural Environment (3.4.4.2)

The following sections describe existing characteristics of the natural environment of the Ely Operating Base Vicinity. Topics covered include Water Resources, Erosion, Air Quality, and Biological Resources.

Water Resources (3.4.4.2.1)

General Hydrology

The Ely OB site is located in the southern portion of Steptoe Valley. The Valley occupies about 1,975 square mi within the Central Hydrologic Region as defined by the Nevada Division of Water Resources (1971). Eakin, Hughes, and Moore (1967) identified the two principal aquifers within the valley as 1) valleyfill deposits, and 2) fractured carbonate rocks of Paleozoic age. The valleyfill deposits consist of interbedded gravel, sand, silt, and clay. The fractured carbonate rocks underlie the valleyfill deposits and crop out in the mountain ranges flanking the valley to the east and west.

The water table within the valleyfill aquifer slopes northward as well as away from the mountains toward the valley axis (Eakin, Hughes, and Moore, 1967). Several areas adjacent to Steptoe and Duck creeks were reported to have depths to water of less than 20 ft. Water-level records compiled by the Soil Conservation Service (Cheney, 1980), indicate that there are several perched aquifers with

groundwater levels about 20 ft below ground level. Depth to water quickly increases, however, to 60, and even to 100, feet below the land surface basinward from these perched aquifers. Records compiled by the U.S. Geological Survey (1978) indicate that groundwater levels in Steptoe Valley declined as much as 20 ft during the period from 1954 to 1964. Since that time, however, groundwater levels have regained their 1954 levels.

Water Availability

The perennial yield of Steptoe Valley was estimated to be 70,000 acre-ft by Eakin, Hughes, and Moore (1967) and confirmed by the State of Nevada (1971). This figure was based upon the assumption that all of the water discharged through evapotranspiration is recoverable. According to estimates by the Desert Research Institute (1980), the present groundwater use in Steptoe Valley is approximately 13,000 acre-ft/year. Agriculture is by far the largest user. Less than 1,000 acre-ft/year were used for domestic and stock purposes, and municipal demands accounted for only about 1,200 acre-ft/year. Additionally, applications on behalf of the White Pine Power Project have been filed to use approximately 52,000 acre-ft/year. This action has led to the "designation" of Steptoe Valley as a critical groundwater basin by the State Engineer's Office because the total allocated quantity of water would approach the estimated perennial yield.

Given the current legal constraints on water development, it is likely that the only local source of available water for M-X may be through purchase of existing rights. Such transfer of water rights would require approval of the State Engineer.

A more detailed presentation of the hydrology of the Ely area is found in ETR-12.

Erosion (3.4.4.2.2)

The soils of the proposed Ely OB site are primarily poorly developed with cemented layers and have formed on gently sloping alluvial fans. Although the inherent erodibility of these soils is not great, the overall erosion hazard is moderate due to the moderate slopes in the area.

Air Quality (3.4.4.2.3)

A summary of some climatological parameters relevant to air quality appears in Table 3.4.1.2-1. Particulate emissions for the Steptoe Valley are 28,908 tons per year from all sources except windblown fugitive dust which contributes an additional 43,758 tons per year. The gaseous pollutants baseline levels are only available on an Air Quality Control Region (AQCR) basis. Ely is located within AQCR No. 147. The baseline levels for CO, SO_x, NO_x, and hydrocarbons reported for AQCR No. 147 are listed in Table 3.4.1.2-2.

Air quality monitoring data collected at the McGill mining facility near Ely show that the National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO₂) has been violated, leading to the SO₂ nonattainment status for Steptoe Valley. Annual total suspended particulate (TSP) levels in 1977 equaled the primary NAAQS. There are no data on other gaseous criteria pollutant levels in the region or the city of Ely.

Biological Resources (3.4.4.2.4)

Vegetation and Soils

The main vegetation and landcover types on the valley bottom and low bajadas of the Ely OB suitability zone are primarily hay meadows, desert marsh and spring, riparian, shadscale scrub, and Great Basin sagebrush. Great Basin sagebrush, grassland, and pinyon-juniper woodland dominate the mid and high bajadas (Figure 3.4.4.2-1).

Comins Lake and Steptoe Creek are located in the portion of the valley proposed as an operating base location. Agriculture (primarily hay meadows) occurs along Steptoe Creek from the town of Ely south towards Comins Lake and in the valley bottom south of Comins Lake.

The bajadas between 6,400 ft and 7,000 ft are dominated by big sagebrush (Artemisia tridentata), black sagebrush (Artemisia nova), and areas of bunchgrass. In some areas the grassland was treated by removing the original native vegetation, usually Great Basin sagebrush. Planted crested wheatgrass (Agropyron cristatum), an introduced forage species, is usually the dominant species in treated grasslands.

The valley floor between the towns of Ely and McGill is dominated by the shadscale scrub vegetation type, including winterfat (Eurotia lanata) and shadscale (Atriplex confertifolia). Pinyon-juniper woodland with an understory of either Great Basin sagebrush or montane brush, consisting of a number of shrubby species including mountain mahogany (Cercocarpus spp.), Apache plume (Fallugia paradoxa) and species of sagebrush (Artemisia spp.) occurs on the high bajadas and lower mountain slopes.

The soils are formed on gently sloping (generally 3 to 5 percent) alluvial fans. They are calcareous, have loamy skeletal textures, and are gray to very pale brown in color. A layer of soil cemented by silica and calcium carbonate, known as a duripan, may be found at less than 29 in. below the surface. The soils are well drained to the duripan, have moderately rapid permeability, low available water capacity, low quantities of organic matter, low shrink-swell potentials and low percolation rates. The erosion hazard of these soils is moderate. The soils of this area belong primarily to the Durorthid great group of the USDA soil taxonomic system. Minor areas of soils belonging to the Torriorthent, Camborthid, and Haplargid great groups also exist.

Wildlife

Mule deer occur throughout the mountains surrounding Ely, with key summer range to the west in the Egan Range and key summer, winter, and yearlong range to the east in the Duck Creek Range. A mule deer migration route crosses Highway 93 to the east of the base site in the Duck Creek Range. Pronghorn range and key habitats are located in the northern portion of the Ely OB suitability zone. Elk range, including key summer and winter habitat, is present to the east in the Duck Creek Range. Sage grouse range, with strutting grounds and brood use areas, is located throughout Steptoe Valley from the valley floor up into the mountains. Waterfowl are found on Comins Lake, in southern Steptoe Valley and many other water sources north of Ely in Steptoe Valley.

Aquatic Species

Within the watershed containing the proposed Ely OB, 17 streams contain trout populations sufficiently large to support game fisheries. The principal game species in these streams are introduced rainbow, brook, and brown trout. Native cutthroat trout are also present in two streams in the northern portion of Steptoe Valley. Northern pike, bass, and other warm-water fish are found in Comins and Bassett Lakes.

Protected Species

Bald eagles (federally protected) have been observed foraging during the winter months approximately 6 mi to the north of the proposed site in Steptoe Valley. They have also been observed approximately 12 mi to the east in Spring Valley. No traditional roost sites have been found in these valleys.

One recommended protected fish, the relict dace, occurs in aquatic habitats about 6 mi or more from the proposed Ely OB (Figure 3.4.4.2-2). A recommended protected snail, the Steptoe turban, also occurs approximately 5 mi from this location. The recommended endangered Bonneville cutthroat trout also resides 50-60 mi north of the site in Goshute Creek. Several of the protected and recommended protected species occur in adjacent valleys, including the Pahrump killifish, relict dace, Bonneville cutthroat trout, White River springfish, sucker, spinedace, and others.

Rare Plants

One critically endangered rare plant, the Monte Neva Indian Paintbrush (Castilleja salsuginosa), is reported to occur in the vicinity (Nevada Division of Forestry under NRS 527.270). Federal rare plant candidate species reported from the vicinity include the paintbrush and, at the same location, the sheathed deathcamus (Zigadenus vaginatus). The broad pod freckled milkvetch (Astragalus lentiginosus var. latus) and the oval-leaf thelypody (Thelypodium sagittatum var. ovalifolium) also are reported from the area (see Appendix A-1 of ETR-17, Protected Species, for greater detail). The spring-loving centaury (Centaureum namophilum var. nevadense), which also is reported from Monte Neva Hot Springs, has recently been determined to be a more common variety (Reveal, 1979).

Wilderness/Natural Areas

Wilderness resources within a 100 air-mile radius of the proposed OB site near Ely are listed in Table 3.4.4.2-1. Significant natural areas within a 50 air-mile radius are listed in Table 3.4.4.2-2.

Human Environment (3.4.4.3)

The following sections describe baseline socioeconomic and cultural characteristics of the Ely Operating Base Vicinity Environment. Included are: Employment, Income and Earnings, Public Finance, Population, Housing, Community Infrastructure, Traffic and Transportation, Energy, Land Ownership, Land Use, Native Americans, and Archaeological/Historical Resources.

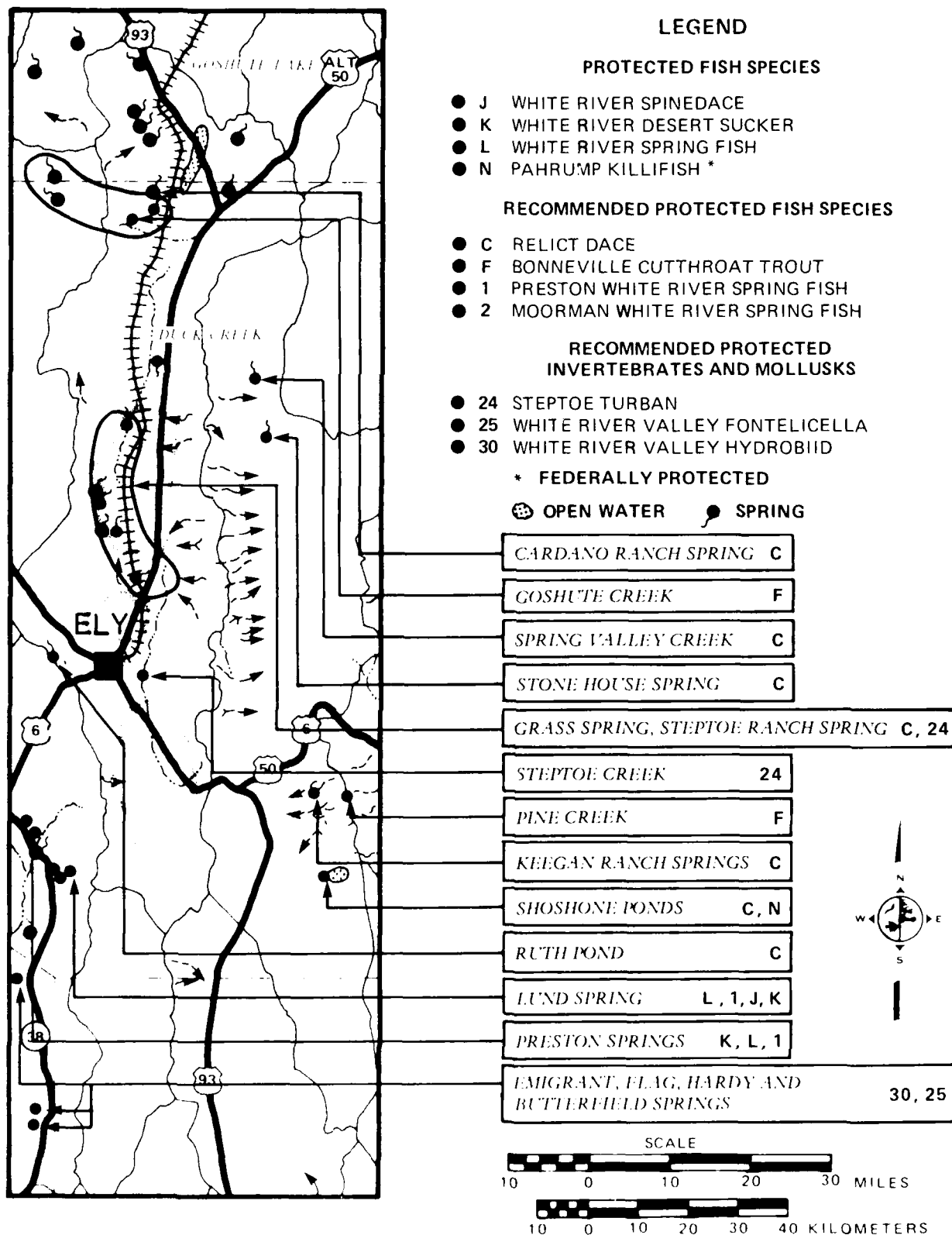


Figure 3.4.4.2-2. Protected and recommended protected aquatic species in the vicinity of Ely.

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Table 3.4.4.2-1. Wilderness resources within a 100 air-mile (160.9 km) radius from the potential Ely OB site¹ (Page 1 of 2).

State	Wilderness Resources	
	Approximate Miles From OB Site	Approximate Km From OB Site
Nevada		
Martin Spring	22	35
Mount Moriah	28	45
S. Egan Range	29	47
Wheeler Peak	32	51
Mount Grafton	34	55
Granite Spring	34	55
Goshute Canyon	42	68
Highland Ridge	42	68
Far South Egan	50	81
Fortification Range	51	82
Blue Eagle	53	85
Riordan's Well	56	90
Table Mountain	68	109
Grant Range (USFS)	73	117
Medsker Pass	73	117
Antelope	76	122
Grant Range (BLM)	77	124
Grant Range (BLM)	80	129
Parsnip Peak	80	129
Roberts	85	137
White Rock Range	86	138
Quinn	86	138
Weepah Spring	87	140
The Wall	88	142
Fandango	90	145
Morey	89	143
Palisade Mesa	92	148
Simpson Park	96	155
Utah		
Deep Creek Mountains	55	89
Conger Mountain	58	93
Mountain Home Range	70	113
Wah Wah Mountains	74	119
King Top	74	119
Notch Peak	77	124
Howell Peak	77	124
Fish Springs Range	78	125
Swasey Mountain	80	129

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Table 3.4.4.2-1. Wilderness resources within a 100 air-mile (160.9 km) radius from the potential Ely OB site¹ (Page 2 of 2).

State	Wilderness Resources	
	Approximate Miles From OB Site	Approximate Km From OB Site
Utah (continued)		
White Rock Range	86	138
Central Wah Wah Range	89	143
Dugway Mountains	98	158

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¹ Wilderness resource areas outside the states of Nevada and Utah were not included in this evaluation.



In addition to an historic commercial area in downtown Ely, new chain stores have opened in East Ely near newer residential development.

Table 3.4.4.2-2 Significant natural areas within a 50 air-mile (80 Km)
radius of the potential Ely OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	Km
Nevada		
Heusser Mt. Bristlecone Pine Research Natural Area	10	15
Eureka Formation Fossils	25	40
Spring Valley White Sage Flat	25	40
Swamp Cedar Research Natural Area	25	40
Osceola Cave and Arch	25	40
Shoshone Pygmy Sage Research Natural Area	30	50
Mount Moriah	30	50
Snake Range	30	50
Cathedral Canyon Natural Arch	35	55
Shoshone Ponds Research Natural Area	35	55
Wheeler Peak Scenic Area	35	55
Mount Grafton	40	65
Goshute Canyon Research Natural Area	50	80
Duckwater	50	80
Lexington Arch	50	80
Kirch Wildlife Management Area	50	80
Utah		
The Caves of Gandy Mountains	45	70
Deep Creek Mountains	50	80

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Employment and Labor Force (3.4.4.3.1)

The potential site for the Ely OB is in the north-central section of the designated Nevada/Utah region of influence (ROI). The area of analysis (AOA) for this operating base option is White Pine County. A detailed analysis of the employment and labor force in the AOA is shown in Section 2.1.3.4 of ETR-44. The communities of Ely, McGill, and Ruth are each within 25 mi of the proposed Ely operating base. This OB site would be used under Alternative 3 and 5 and would be the second OB in each case. Other alternative OB sites include Coyote Spring, Nevada; Milford, Delta, and Beryl, Utah; Clovis, New Mexico; and Dalhart, Texas.

The economy of the Ely area has traditionally revolved around mining and processing metallic ores. However, mine closings have severely eroded this base in recent years. Employment in the government sector now exceeds mining employment in White Pine County. Increased oil exploration and the possible construction of the White Pine Power Project could change the economy and employment characteristics of the Ely area in the near future.

Agriculture provides only a small share of total employment in White Pine County, but is important because it is generally stable, and because irrigation of crops consumes quantities of water far exceeding other uses in the area.

Recent Labor Force Trends

The county has recently experienced a sizable economic downturn because of reduced copper mining and smelting. Kennecott Copper Corporation ceased mining operations at locations in White Pine and Lyon counties, eliminating about 1,000 jobs. The county labor force peaked in 1974 and 1975 at 4,260 and 4,220 persons, respectively, and then sharply declined by 200-400 workers per year through 1979. The size of the county's civilian labor force stabilized in 1979-80 at about 3,100 workers, or 1,100 less than the 1974-75 level.

Reductions in county employment levels on a labor force basis are the cause of labor force decreases over the past 7 years. Employment peaked in 1974 at 4,060 workers and dropped to 2,780 by 1979. The 1980 county employment level increased to 2,900 workers, or a gain of 4 percent over 1979.

White Pine County unemployment has been substantially above state and national levels since the layoffs in the county's copper industry in the mid-1970s. The local unemployment rate reached 23.5 percent in 1976, and averaged 12.2 percent over the 6 years from 1975-80. The 1980 figure of 7.6 percent represents the first significant reduction in White Pine County unemployment rate below double-digit levels since 1974. Nevertheless, 1980 unemployment in the county was substantially above the Nevada rate of 6.2 percent and the U.S. rate of 7.1 percent.

Projected Employment

Employment projections for White Pine County under both trend-growth and high-growth conditions are presented in Table 3.2.3-3. The largest prospective non-M-X development in the county is the White Pine Power Project (WPPP). This

project includes the construction and operation of a 1,350 MW coal-fired power plant, scheduled to begin in 1984. If realized, this project would peak in 1987, generating an expected 2,800 new jobs. This growth would be roughly 94 percent of total county employment of 3,000 jobs in 1987. In the long run, 1,700 jobs would be created.

In addition, a major new electronics manufacturing facility is under construction near Ely. The Lynch Communication Systems' operation is expected to employ 100 people by late 1981, and 500 by 1990 (Bourne, White Pine County, 1980). Information on this development was not available in time to include the project in the baseline projections.

Table 3.4.4.3.1-1 presents trend-growth and high-growth employment projections for the three sectors of White Pine County which would be significantly affected by M-X deployment--construction, trade, and services. The projections (from BEBR, University of Utah) imply modest growth in each of these sectors under trend-growth conditions. The high-growth projection, reflecting the impact of the White Pine Power Project, indicates a rapid increase in employment in each sector, followed by a significant decline. This trend would be most pronounced in the construction sector.

Income and Earnings (3.4.4.3.2)

Ely

Location of an OB near Ely would principally affect White Pine County. Detailed baseline data can be found in ETR-2L.

White Pine County

Total earnings (labor and proprietors income by place of work) amounted to approximately \$44.5 million in 1979. Very little growth has occurred in the 1974-79 period, with losses in the mining sector contributing heavily to the extremely low overall earnings growth. Much of the loss in mining is attributable to reduced copper mining and smelting activities beginning in 1976. The principal source of earnings in the county currently comes from the government sector. Earnings from government, as a percentage of total county earnings, rose from approximately 15.4 percent in 1974 to 23.1 percent in 1979.

Personal income per capita was \$7,032, substantially less than the state average. Earnings per worker in the county amounted to \$11,827 in 1979, approximately 90 percent of the state average of \$13,111.

Public Finance (3.4.4.3.3)

Table 3.4.4.3.3-1 presents recent historical information on revenues and expenditures for White Pine County, the city of Ely and White Pine County school district. Additional baseline data are presented in ETR 2L. From 1974-75 through 1979-80, property tax revenues in White Pine County have decreased. Property taxes accounted for a 46 percent share of county revenues in FY 1974-75, but decreased to a 21 percent share by FY 1979-80. The city of Ely, however, has continued to receive an average of 28 percent share of its revenues from property taxes. The economic turbulence during the period, owing to the fluctuations in mining conditions and the closing of the Kennecott copper mine, had a more

Table 3.4.4.3.1-1. Projected employment in construction, trade, and services in White Pine County under trend-growth and high-growth conditions, 1982-94 (number of jobs).

Year	Trend-Growth			High-Growth		
	Construction	Trade	Services	Construction	Trade	Services
1982	71	239	448	71	239	449
1983	73	244	465	73	244	466
1984	75	250	481	164	257	493
1985	78	257	500	601	411	703
1986	80	262	513	1,240	474	791
1987	82	267	526	1,843	538	896
1988	84	272	538	1,421	519	874
1989	86	278	552	644	475	817
1990	88	285	566	161	442	781
1991	90	290	581	161	458	814
1992	92	296	594	164	460	827
1993	95	301	609	172	472	847
1994	97	307	623	175	481	874

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Note: Projections are presented to the nearest job only for convenience in review and do not imply this level of accuracy.

Source: University of Utah, Bureau of Economic and Business Research, 1980.

Table 3.4.4.3.3-1. Recent average annual growth rates and percentage shares of specific revenues and expenditures, by category, for selected local taxing jurisdictions.

Revenues/Expenditures	White Pine County	City of Ely	White Pine County School District
Total General Fund Revenue			
Annual Rate ¹	11.5	8.9	N/A
Property Tax Revenues			
Annual Rate ¹	-5.0	9.9	22.2
Percent of General Fund	35.2	22.2	N/A
Intergovernmental Transfers			
Annual Rate ¹	19.4	9.4	N/A
Percent of General Fund	38.7	58.4	N/A
Total Expenditures			
Annual Rate ¹	12.6	9.9	N/A
Public Safety Expenditures			
Annual Rate ¹	13.6	7.4	N/A
Percent of General Fund	24.6	40.3	N/A
Total Revenues ¹			
Annual Rate	N/A	N/A	7.3
State Revenues			
Annual Rate	N/A	N/A	10.6
Percent of Total Revenues	N/A	N/A	51.9
Local Revenues			
Annual Rate	N/A	N/A	3.4
Percent of Total Revenues	N/A	N/A	39.8
Total Expenditures			
Annual Rate	N/A	N/A	6.4
Instruction Expenditures			
Annual Rate	N/A	N/A	4.4
Percent of Total Expenditures	N/A	N/A	62.9

T5472/9-23-81/F

¹ Annual compound rate of change.

Source: HDR Sciences.

pronounced effect on White Pine County than on the city of Ely. The effects are clearly seen by comparing the annual average growth rate for property tax revenues over a five-year period. White Pine County shows a five percent loss, while Ely shows a ten percent gain in tax revenues.

Intergovernmental transfers of other tax monies, principally from government funding and cigarette, liquor, and motor vehicle privilege taxes, account for a significantly larger share of revenues for Ely than for the county. White Pine County has experienced an increase from 35 percent of total revenues from intergovernmental sources in FY 1974-75 compared to 49 percent of total revenues for the last two fiscal years. The loss in local revenue contribution has been offset by increased governmental transfers, resulting in a growth rate of 12.6 percent for total revenues from FY 1975 to FY 1980. Ely relied more heavily on non-local revenues. Intergovernmental transfers have remained at a consistent 58 percent of total revenues over the five-year time span. Total revenues have grown at a modest average annual rate of 8.9 percent.

Both White Pine County and Ely allocate the greatest portion of their budgets to public safety (police and fire protection). These expenditures range from 24.3 percent of general fund outlays in White Pine County to 40.0 percent in Ely.

School district revenues and expenditures are also presented in Table 3.4.4.3.3-1. In the White Pine County school district, principal sources of revenue are from state and local revenues. State contributions come principally from the Distributive School Fund, which, along with other minor sources, has contributed an average of 51.9 percent of the school district's total general fund revenues over FY 1975 to FY 1978-79. Local sources, mostly property and sales taxes, contribute approximately 9.7 percent, while the federal government and the school district combined contributed less than 10 percent during the five-year period. Principal expenditures were for instruction (salaries and supplies) and operation and maintenance of the physical plant. With most of the area's population centered around Ely, transportation costs are not substantial, at 5.5 percent of total operating costs.

Assessed valuations for local jurisdictions in White Pine County are presented in Table 3.4.4.3.3-2. In all jurisdictions, much of the total bonding capacity is available. However, because of the relatively low tax base, reserve bonding capacities are limited, ranging from \$4.7 million in White Pine County to \$7.4 million in White Pine County school district.

In summary, jurisdictions in the White Pine County area have sufficient resources to provide for increased services associated with low to moderate growth. However, to the extent that each government unit depends on outside aid, and that local sources of revenue are becoming less available, these jurisdictions are ill-equipped to deal with large-scale rapid growth.

Population and Communities (3.4.4.3.4)

White Pine County, a sparsely settled county in east central Nevada, constitutes the area of analysis (AOA) for the proposed operating base near Ely. The extent of the AOA is determined by the maximum daily commuting zone for direct project employees who would have work locations on the OB. White Pine, the only

Table 3.4.4.3.3-2. Assessed valuation, indebtedness limitations, and reserve bonding capacities, 1980.

Jurisdiction	Assessed Value	Indebtedness Limitation	Outstanding G.O. Bonds	Reserve Bonding Capacity	Debt Tax Rate 1980-81	Year of Final Payment
White Pine County	49,227,651	4,922,765	255,000	4,667,765	0.0630	1987
School District	49,227,551	7,384,148	0	7,384,148	0	0
City of Ely	17,508,813	5,252,644	0	5,252,644	0	0
T5423/8-31-81						

¹ Per \$100 Assessed Value.

Source: Nevada Department of Taxation, 1981, Local Government Green Book, Statewide Indebtedness Report of Nevada Local Governments.

county within the Nevada/Utah ROI to lose population during the last decade, had 8,167 residents in 1980. The county's population decreased by almost 2,000 persons, for an annual rate of change of -2.2 percent between 1970 and 1980 (see Table 3.4.4.3.4-1). All of the population decrease has occurred during the mid 1970s in Ely township, which includes the communities of Ely, Ruth, and McGill, and was associated with the closing of the Kennecott Copper Company mine in the vicinity. More recently, data indicate that the county's population has stabilized and experienced moderate gains in the last several years.

About 60 percent of White Pine's population was concentrated in Ely, the only incorporated place, which had 4,882 residents in 1980. Smaller, unincorporated communities include Ruth, McGill, Lund, and Baker. Population density is very low in the county, with an average of less than one person per sq mi in 1980. Persons of Spanish origin comprised the largest ethnic minority in the county with about 9.4 percent of the population in 1980, while Native Americans constituted 2.8 percent. Average household size in the county, 2.68 persons, was smaller than the national, but slightly greater than the state, average size.

Housing (3.4.4.3.5)

The number of housing units in White Pine County increased by a moderate 0.9 percent per year average growth rate between 1970 and 1980, rising from 3,339 to 3,664 units. Almost all the total county housing stock is located in the community of Ely (58 percent) and in the adjacent communities of East Ely, Ruth, and McGill (U.S. Department of Commerce, Bureau of the Census, 1981).

According to a 1976 survey, 82 percent of the county housing stock was in single family units, 15 percent in mobile homes, and the remaining 3 percent in multiple family units. The proportion of the housing units made up of mobile homes has been increasing steadily: 3.5 percent in 1960, 12.1 percent in 1970 and 15 percent in 1976 (Sharp, Krater Associates, 1976).

Over the period 1970-1979, there have been an average of 13 dwelling units authorized for construction annually, and the vast majority of these (83 percent) have been single family homes (U.S. Department of Commerce, Bureau of the Census, 1970 to 1979, inclusive).

White Pine County is projected to experience an average annual rate of growth of its housing stock of 0.1 percent over the period 1982-1994 under trend-growth conditions. This equates to an increase of 49 units from a base in 1982 of 3,215 units. Under high growth conditions, the increase amounts to 1,934 units from a base of 3,215 units in 1982 with an average annual rate of growth over the period 1982-1994 of 4.0 percent (refer to Table 3.2.3.4.2-1). These rates of change compare with 2.7 and 2.8 percent, respectively, for trend- and high-growth projections for the deployment region.

Community Infrastructure (3.4.4.3.6)

Education

In 1980-81, there were 1,704 students enrolled in the seven schools which comprise the White Pine County School District. Enrollments totaled 141 at the

Table 3.4.4.3.4-1. Population and population change 1970-1980 by county and community within the Ely OB area of analysis.

County/Community	Population		Change 1970-1980		
	1980	1970	Number	Percent	Annual Rate ¹
White Pine County, Nevada	8,167	10,150	-1,983	-19.5	-2.2
Baker twp ²	212	146	66	45.2	3.8
Ely twp	7,599	9,686			
Ely city ³	4,882	6,168	-1,286	-20.8	-2.3
remainder Ely twp	2,717	3,518	-801	-22.8	-2.6
Lund twp	356	318	38	11.9	1.1

T5126/8-12-81

¹ Annual compound rate of change.

² Township.

³ 1970 census data adjusted to reflect 1980 city boundaries.

Source: U.S. Bureau of the Census, Nevada Final Population and Housing Unit Counts, (PHC80-V-30), March 1981.

kindergarten level, 675 in the elementary grades, 762 in the secondary grades, and 126 in special education courses. Ninety-five teachers were employed by the White Pine School District. The classroom facilities of the system currently have an excess capacity of more than 1,000 pupils (Nevada Department of Education, 1981).

Health Care

The 44-bed William B. Rivie hospital in Ely had a utilization rate of 28 percent in 1978. The facility represents 6.1 beds per 1,000 population. The White Pine Care Center in Ely has 86 skilled-nursing beds, and 13 intermediate-care beds. There is also a rural-clinic community mental health center in Ely. Four physicians serve the area along with 29 registered nurses, 18 LPNs, 3 dentists, 6 mental health professionals, and 87 emergency medical technicians (Office of Economic Adjustment, Community Profile, 1981). White Pine County was designated a "Critical Health Manpower Shortage Area" in 1980 by the National Health Corps because of shortages of doctors, dentists, and psychiatrists.

Police Protection

In White Pine County law enforcement services are provided by the White Pine County Sheriff's Department, the Ely Police Department, and the Nevada Highway Patrol. The White Pine County Sheriff's Department presently employs 1 sheriff, 1 undersheriff, 11 full-time and 2 part-time deputies. Ely Police Department has 1 chief, 1 assistant chief, and 12 patrolmen. Nevada Highway Patrol has 3 officers stationed in the county (Office of Economic Adjustment, Community Profiles, 1980).

Fire Protection

Fire protection services are provided by one volunteer and two professional fire fighting companies. Ely Fire Department employs 1 fire chief, 5 firemen, 45 volunteers, 4 firefighting vehicles and 2 rescue trucks which operate out of one host station. Its fire insurance rating was five. McGill, with an insurance rating of seven, has 4 firemen, 11 volunteers, and 2 vehicles. Volunteer fire departments are located exist in Ruth, Baker, and Lund. Total pumping capacity is 7,500 gpm in Ely and 2,600 in the remainder of the county. (Office of Economic Adjustment, Community Profiles, 1980).

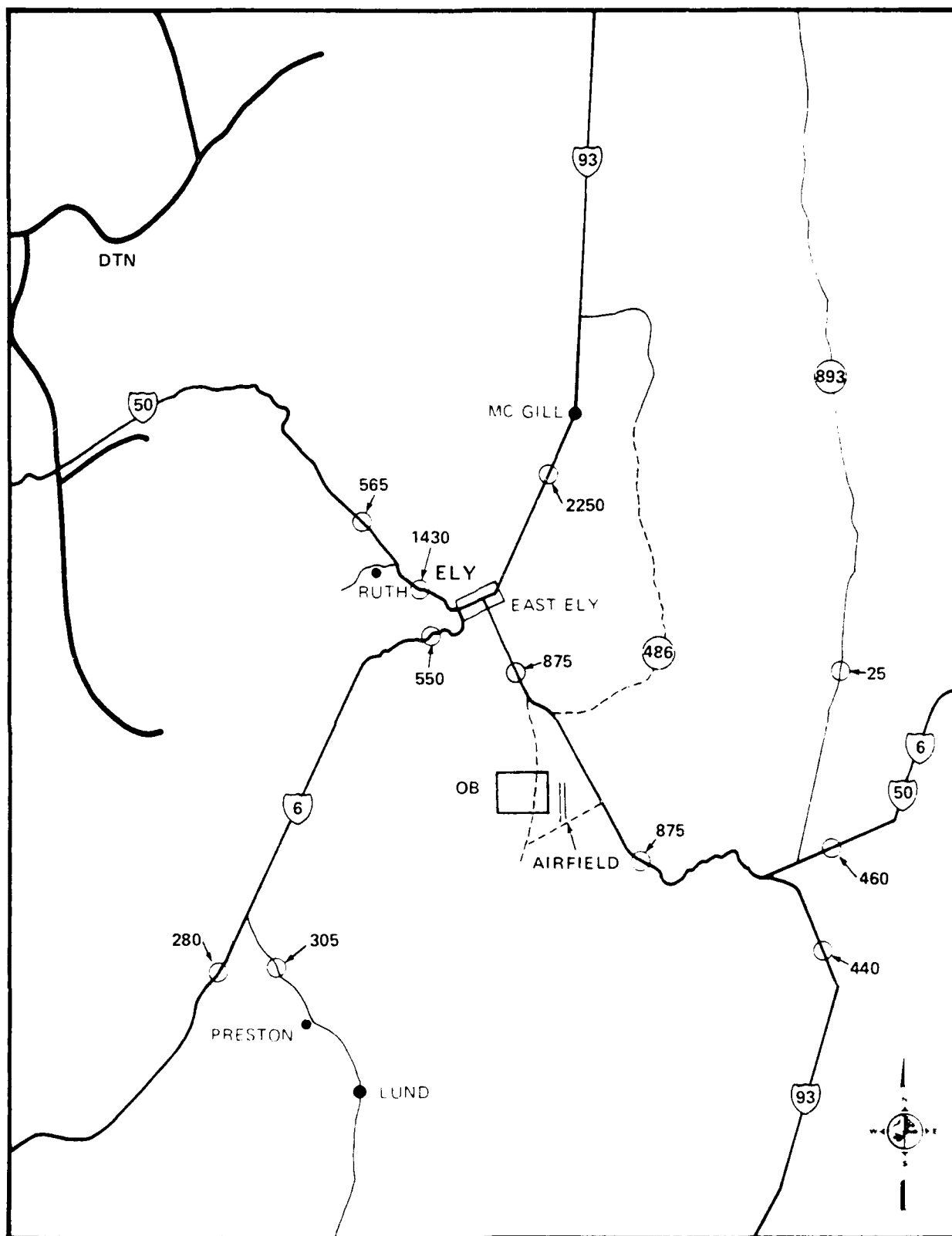
Traffic and Transportation (3.4.4.3.7)

The proposed base site is 10 mi south of Ely on the Pioche Highway (U.S. 50 and 93). A map of the existing road network around Ely with 1980 traffic volumes is shown in Figure 3.4.4.3-1. Major roadways in the area are U.S. Highway 6, 50, and 93, and State Highway 893. The Pioche Highway south of Ely currently has an average daily traffic of 820 vehicles.

Ely is served by the Nevada Northern Railroad, which has its southern terminus near Ely and runs north to connect with the Western Pacific Railroad near Shafter, Nevada. Limited commercial airline service is available at Ely.

Energy (3.4.4.3.8)

Ely has no natural gas service. Service could be extended into the area by Southwest Gas Corporation (SGC) in Las Vegas, but there are presently no plans for



LEGEND 000 - 1980 TRAFFIC VOLUMES, ELY, NEVADA

SCHEMATIC NOT TO SCALE

2179 A-1

SOURCE: NEVADA DEPARTMENT OF TRANSPORTATION

Figure 3.4.4.3-1. Existing traffic volumes in the vicinity of Ely.

such an extension. The closest point on the SGC distribution system is approximately 125 mi north-northwest of Ely in the Elko area. One of the alternative natural gas pipeline routes (central Nevada alternative) of the proposed Rocky Mountain pipeline may pass near Ely.

Home energy requirements in Ely are supplied by bottled gas, fuel oil, and electricity. Bottled gas, fuel oil, gasoline and diesel fuel are trucked from bulk fuel handling terminals in Salt Lake City and Las Vegas to local distribution centers. The bottled gas (propane) is marketed locally by three companies: H&R Propane, CAL-Gas, and Turner Gas.

Electrical energy to the Ely area is supplied by Mt. Wheeler Power, Inc., a Rural Electric Cooperative with a peak system demand of approximately 25 MW. Mt. Wheeler Power has no generating facilities and relies on purchased power transmitted from other utilities via transmission lines. At present the transmission line capacity in the area is limited and the availability of additional transmission facilities is questionable.

Land Ownership (3.4.4.3.9)

The suitability zone for the potential OB site is divided into three portions, one portion, with about 40 percent, is located south of Ely and the remaining two portions are north of that town. About 40 percent of the suitability zone is BLM land; the remainder is owned privately.

Land Use (3.4.4.3.10)

Urban Land Use

The location of an OB near Ely would affect urban land use in White Pine County especially in and around existing communities. Availability of land for urban development and the status of the land use planning activities are outlined below. Discussion of the county's policies and goals, plus illustration of the master plan maps are available in ETR-36, "Urban Planning and Growth."

White Pine County

Urban development in the unincorporated areas of White Pine County is undertaken under the direction of the White Pine Board of County Commissioners and the White Pine County Regional Planning Commission (representing the county and the city of Ely). The county adopted a general plan in 1970 and had a revision prepared in 1976. The revision was not adopted by the county and since that time a second revision was begun, but not completed in early 1981. The county adopted zoning and subdivision ordinances in 1970 and 1971, respectively, in order to implement the general plan.

The City of Ely adopted its general plan in 1970 and, like the county, declined to adopt the revised general plan prepared in 1976. The city's zoning and subdivision ordinances were prepared in 1970 and 1980 respectively. The city is anticipating that its master plan and zoning ordinance will be revised by the White Pine County Regional Planning Commission if it is successful in hiring a planner in the summer of 1981. Residential housing in Ely covered almost one quarter of the city's land area

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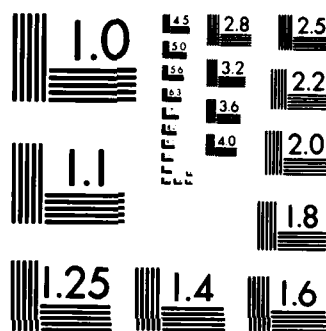
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

in 1976: single-family housing used 437 acres; mobile homes 42 acres; and multi-family housing 21 acres (Table 3.4.4.3.10-1). Vacant and open space lands in Ely totalled 770 acres or 37 percent of the city's land area, a proportion that should be sufficiently large to accommodate baseline growth during the long range planning period of the general plan. However, two proposals have been recently made for annexation of lands to the northwest (40 acres) and south (6.5 sq mi) of the city. Need for the latter annexation is partially based upon growth expected from M-X activities. McGill, about one-third of the size of Ely in terms of urban development, is the second largest urban area in White Pine County while Ruth ranks third. Existing land uses in 1976 for these two communities are shown in Table 3.4.4.3.10-1. Preston-Lund and Baker, each with less than 100 acres of urban development, are the smallest unincorporated settlements in the county and are not included in the above table.

Agriculture

Considerable irrigated croplands and improved pasture are located near the proposed OB facilities at Ely, Nevada, which lies in the northern portion of the BLM Horse and Cattle Camp Planning Unit. The predominant land use in the vicinity of the OB facilities is as improved pasture (see Figure 4.3.3.11-5).

About four percent of the approximately 170,000 acre zone is in irrigated cropland and another four percent is in dry cropland. The remainder is grazing land. About 40 percent of the zone is located south of Ely and 60 percent to the north. (see Figure 4.3.3.11-6).

Recreation

Parklands

There are a number of developed camp and picnic grounds (11) in the Humboldt National Forest around Ely. In addition, there are two Nevada State Park campgrounds (Table 3.4.4.3.10-2). These areas provide approximately 180 camping sites close to Ely. Although somewhat farther away, the Lehman Creek and Wheeler Peak campgrounds draw a number of people because of the attraction of Lehman Caves National Monument and the Wheeler Peak Scenic Area, an area known for its exceptional geology and plant life, including an ancient bristlecone pine forest. At the present time, the Department of the Interior is considering a proposal to designate a portion of the Snake Range-Spring Valley area as the Great Basin National Park.

Approximately 50 to 60 mi to the south, the Nevada Department of Wildlife has two wildlife areas, Railroad Valley and Wayne A. Kirch. Both these areas provide hunting opportunities and the Kirch area has fishing. The Ruby Lake National Wildlife Refuge is approximately 100 mi to the north of Ely and offers excellent hunting and fishing opportunities.

Water-Related Recreational Facilities

There are three bodies of water large enough to support boating; Cave, Bassett, and Comins lakes, all within 50 mi of Ely. The lakes total 175 surface acres to provide fishing and boating (power and nonpower). Ruby Marsh and the Dacey, Hay Meadows, and Adams-McGill reservoirs all have fishing and boating, but as noted above are much farther away. The nearest water skiing area is at Spring

Table 3.4.4.3.10-1. Existing land use -- White Pine County, Nevada.

Land Use	Ely		McGill		Ruth		White Pine County Total	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Single Family Residential	436.8	21	170.9	37	71.4	32	679.1	25
Mobile Home Residential	41.6	2	13.9	3	13.4	6	68.9	3
Multiple Family Residential	20.8	1	9.2	2	0	0	30.0	1
Commercial	83.2	4	9.2	2	2.2	1	94.6	3
Industrial	41.6	2	13.9	3	0	0	55.5	2
Public and Quasi-Public	187.2	9	55.4	12	46.8	21	289.4	11
Streets and Railroad	499.2	24	110.9	24	44.6	20	654.7	24
Developed Land Subtotal	1,310.4	57	383.4	83	178.4	80	1,872.2	68
Underdeveloped and Open Space	769.6	37	78.6	17	44.6	20	892.8	32
Total	2,080.0	100	462.0	100	223.0	100	2,765.0	100

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Source: Sharp, Krater, and Associates, 1976, "General Plan for White Pine County City of Ely"; HDR Sciences.

Table 3.4.4.3.10-2. Developed recreation sites in the Ely vicinity.¹ (Page 1 of 2)

Site Name	Activity	Units	+Miles From Ely
Humboldt National Forest			
Ward Mt. Rec. Area	Camping	22 sites	8
	Picnicking	--	
	Hunting	--	
East Creek	Camping	52 sites	15
	Picnicking	--	
	Hunting	--	
	Fishing	stream	
Bird Creek	Picnicking		20
	Hunting	--	
	Fishing	stream	
Timber Creek	Camping	12 sites	30
	Picnicking	--	
	Hunting	--	
	Fishing	stream	
Berry Creek	Camping	4 sites	35
	Hunting	--	
	Picnicking	--	
	Fishing	stream	
Cleve Creek	Camping	10 sites	50
	Picnicking	--	
	Hunting	--	
	Fishing	stream	
Lehman Creek	Camping	34 sites	65-70
	Picnicking	--	
	Fishing	stream	
	Hunting	--	
Wheeler Peak	Camping	37 sites	70-75
	Picnicking	--	
	Hunting	--	
	Fishing	stream	
Baker Creek	Camping	17 sites	65
	Picnicking	--	
	Hunting	--	
	Fishing	stream	
White River	Camping	8 sites	35
	Fishing	stream	
	Hunting	--	
	Picnicking	--	

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Table 3.4.4.3.10-2. Developed recreation sites in the Ely vicinity.¹ (Page 2 of 2)

Site Name	Activity	Units	+Miles From Ely
Humboldt National Forest (continued)			
Currant Creek	Camping	6 sites	50
	Fishing	stream	
	Hunting	--	
	Picnicking	--	
Nevada State Park System			
Cave Lake	Camping	20 sites	15
	Picnicking	--	
	Fishing	--	
	Hunting	--	
	Boating	1 launch	
Ward Charcoal Ovens	Camping	6 sites	15
	Picnicking	--	

T3808/9-29-81/F

¹ Within an approximate 50 mi radius.

Source: U.S.D.A., 1969.

Valley Reservoir to the south. However, a limited amount of waterskiing occurs at Comins Lake (Nevada Division of State Parks, 1977).

Snow-Related Recreational Facilities

There are no developed alpine ski areas around Ely; however, cross-country skiing and snowplay areas exist in the Snake and Schell Creek Division of the Humboldt National Forest and the Ward Mountain Recreation Area. The nearest alpine skiing facilities would be at Mt. Charleston in the Spring Mountains to the south (Nevada Division of State Parks, 1977).

ORV and Other Forms of Dispersed Recreation

There are no developed ORV parks in the Ely vicinity. The supply of off-road vehicle areas is virtually incalculable with the present data. U.S. Forest Service trails and much of the BLM lands are available. Both these agencies are in the process of evaluating areas for ORV-use designations in accordance with executive order 11644/1972. ORV use as a means of access to remote areas or for the enjoyment of driving and sightseeing may occur over most of the 64,201 acres of BLM land and on the existing trails over the 600,000 acres of U.S. Forest Service land (in White Pine County).

The U.S. Forest Service maintains 178 mi of hiking trails in White Pine County with an additional 5 mi in privately owned areas (Nevada Division of State Parks, 1977). The BLM maintains 17 mi of ORV trail in the Blue Mass Scenic Area north of Mt. Moriah (Nevada Division of State Parks, 1980).

Recreation Within the Suitability Zone

There are two recreation sites within the suitability zone of the proposed OB, Comins and Bassett lakes. It is doubtful that these lakes will be directly impacted by the construction of the OB or that access to them will be limited. Their value as recreational resources (they are two of only three lakes in the vicinity) and their small area, approximately 150 acres, would suggest for avoidance by the project. Both lakes are in private ownership and may be drained if the water is needed by the owners. If preserved, recreational activity is expected to persist.

The BLM (1978) has identified two areas north of Ely, Smith Valley and Duck Creek Basin, as areas of high potential ORV use. Portions of these areas occur within the two suitability zones to the north. Location of the OB within either zone will no doubt result in some restrictions in ORV activity within the area. In all likelihood, any ORV use that may have occurred in these areas will occur in more remote areas within these valleys and the Heusser Mountain area. The remainder of land in public domain is subject to small game hunting, dispersed camping, and collecting.

Mining

The site is about four mi from the Ward mining district and is covered with mining claims and/or oil and gas leases. Silver King Mines has an active operation at Ward District, northwest of the site and a producing mine in the Taylor district east of the site.

Native Americans (3.4.4.3.11)

Cultural Resources (3.4.4.3.11.1)

Ely and vicinity was a major Shoshone occupation area in late prehistoric and early historic times. Nineteenth century Indian villages are recorded for Ely, Duck Creek, Warm Springs, Schellbourne, Egan Canyon, and Cherry Creek. Additionally, the Ely, Duck Creek, and Cherry Creek villages served as festival centers in historic times. A total of 20 known habitation sites occur in the Steptoe Valley unit. This undoubtedly represents only a small fraction of potential sites. The unit contains 239 springs, a large number of which are likely to be associated with sensitive cultural materials.

Due to the formerly dense Shoshone occupation of the Ely area, extensive burial grounds are expected in the foothill and mountain areas. Nine caves and natural rock shelters are recorded, one of which is associated with rock art. The Egan and Schell Creek ranges which flank the Steptoe Valley also contain extensive pinyon groves. Pine nuts continue to be harvested annually by contemporary Native American Indians in the area, and constitute a valuable cultural resource.

Although Steptoe Valley is known to have been a Shoshone population center, little is known about late prehistoric and early historic settlements south of the Ely area. Archaeological sites of undetermined antiquity are found along the numerous springs which occur in the Egan and Schell Creek ranges. Historic Shoshone settlements are especially likely along Steptoe Creek, just west of the proposed base area. Culturally sensitive burial and spiritual sites are expected to be in foothill and mountain regions.

Native American Land/Water Resources (3.4.4.3.11.2)

There are two Shoshone Indian reservations in the vicinity of the proposed Ely OB, the Ely Colony and the Duckwater Reservation. The Ely Colony consists of 110 acres located in the town of Ely and has an enrolled population of 187. The Duckwater Reservation consists of 3,815 tribally owned acres 70 mi southeast of Ely and has an enrolled population of 124.

Ely Colony

The Ely Colony of Western Shoshones consists of three separate parcels. The "Old Ely Colony," established through a federal government purchase in 1931, is located on 10 acres of steep terrain southwest of Ely, Nevada. The "New Ely Colony," established in 1973, consists of 10 acres of cedar-covered foothills to the southeast of Ely; this parcel is currently leased from White Pine County, but the tribal council has requested an exchange of 10 acre parcels with the county. An additional 90 acres of undeveloped land was granted to the Ely Colony Shoshones in 1977 from the U.S. Forest Service and BLM. This area is located between the old and new Ely colonies, on relatively flat terrain. All three portions of the colony are located less than 1/2 mi from U.S. Highways 50, 93 and 6.

Both 10 acre parcels of the Ely Colony are used for residential purposes. The Ely Tribal Council plans to develop the recently acquired 90 acre parcel for commercial use. Tentative plans include a restaurant and truck maintenance

facility. The proximity of the Ely Colony to the major transportation corridors of the Great Basin render this a particularly attractive possibility.

The mountains surrounding Ely are rich in natural resources, including pinon pine, juniper, aspen and cedar. The extent to which these resources are currently used by residents of the Ely Colony is not known. The ancestors of the Ely Colony were forced from these traditional hunting and gathering areas by mining operations.

Duckwater Reservation. The Duckwater Reservation consists of 3,785 acres of arid land in Central Nevada. Duckwater Stockman's Association also holds permits for 532,000 acres of rangeland. Boundary descriptions of the grazing lands are subject to dispute, but the area is generally contained within four hydrologic units: Little Smoky North, Little Smoky Central, Little Smoky South and Railroad North.

Farming plays a small role in reservation economics. Cattle ranching provides the basis of the reservation's economy. Ranching operations are organized under a tribal cooperative, but herds are independently owned. Due to inadequate water supplies, Indian and non-Indian ranchers are highly dependent on the use of large BLM grazing allotments in order to provide adequate forage for their herds.

Ranching and farming operations are fundamental to future economic development plans. The tribe intends to expand its economic potential agriculturally by improving the present irrigation systems, which will increase the arable land lease establishing a large tribally owned cattle herd (as opposed to individually owned herds), and by requesting legislation to acquire more land from the Bureau of Land Management and the Forest Service.

Foothill areas, mountain ranges and valleys over a widespread area around the Duckwater region are used to varying extents by the western Shoshone for hunting, gathering, and fishing. Wild animal food sources for the Duckwater Shoshone include: ducks, geese, sage hen, groundhog, ground squirrels, deer, antelope, mountain sheep, trout, chub, carp, bullfrogs, lynx, bobcat, coyote, fox, badger and weasel. Gathering plants and herbs in season is another important noncash economic activity. Floral resources include sage, sunflower, rye, sego lily roots, chokecherries, camus root, Indian tea, wild asparagus, wild onions, watercress, morning glory roots, tule roots, greasewood, juniper, and pinion nuts. These plants and herbs are used for food, seasoning, and for medical purposes.

Socioeconomic Characteristics (3.4.4.3.11.3)

Ely Colony has a population of 187, Duckwater, 148. In marked contrast to the steadily declining population in the Ely area since the close of the Kennecott mines, the populations at both reservations have been increasing over the past seven years. In each case, the growth is at least partially attributable to the completion of new housing units. However, each reserve has ambitious development plans and the possibility of new economic opportunities may also be attracting returnees.

The combined Indian labor force for the Duckwater Reservation and Ely Colony is estimated to be 75 men and women, of whom 47, or 62 percent, are unemployed. Of the 29 employed Indians, 21, or 72 percent, earn under \$5,000/year.

The average per capita income for the Duckwater Reservation and the Ely Colony is \$700/year and the average family income is \$3,200-\$3,500/year.

Archaeological and Historical Resources (3.4.4.3.12)

The three segments of the Ely OB vicinity zone are within one of the most well-watered valleys in the study area. The wooded foothills and mountains contain hundreds of springs which drain to the valley floor, where they feed into a major drainage, Duck Creek. The dense pinyon-juniper stands in the upper elevations are prime locations for sites. Indeed, although a minute portion of the valley was sampled during the 1980 regional survey, all sites found were associated with springs in the woodland, and had been extensively occupied and re-visited for thousands of years by Archaic and later prehistoric groups. Shoshone shards were also found. Duck Creek was not surveyed, but numerous sites are probably located near it. In general, all segments of the vicinity zone are likely to contain dense concentrations of sites.

The Ward Charcoal Ovens National Register Site is located immediately west of the vicinity zone. The six stone, beehive ovens were used to reduce timber for the smelters of Ward, a mining town dating to 1897.

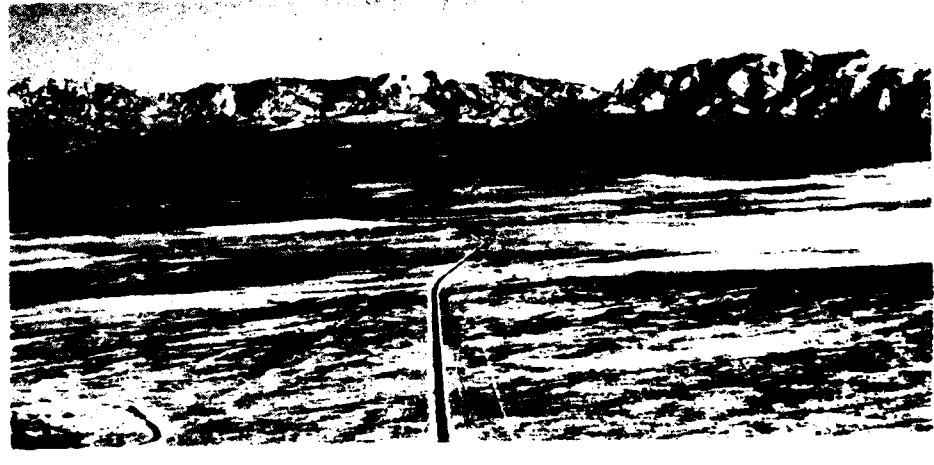
Paleontology

Along the edge of Steptoe Valley between Ely and the proposed Ely OB site are outcrops of the Sheep Pass Formation. Some of these outcrops contain fossils, and one vertebrate fossil has been found. Paleozoic rocks outcropping in the mountain ranges east and west of the valley contain an assortment of fossils.



The Ward Charcoal Ovens are located down this road to the west of the OB vicinity zone. The six stone, beehive ovens are a National Register Site.

Milford



MILFORD

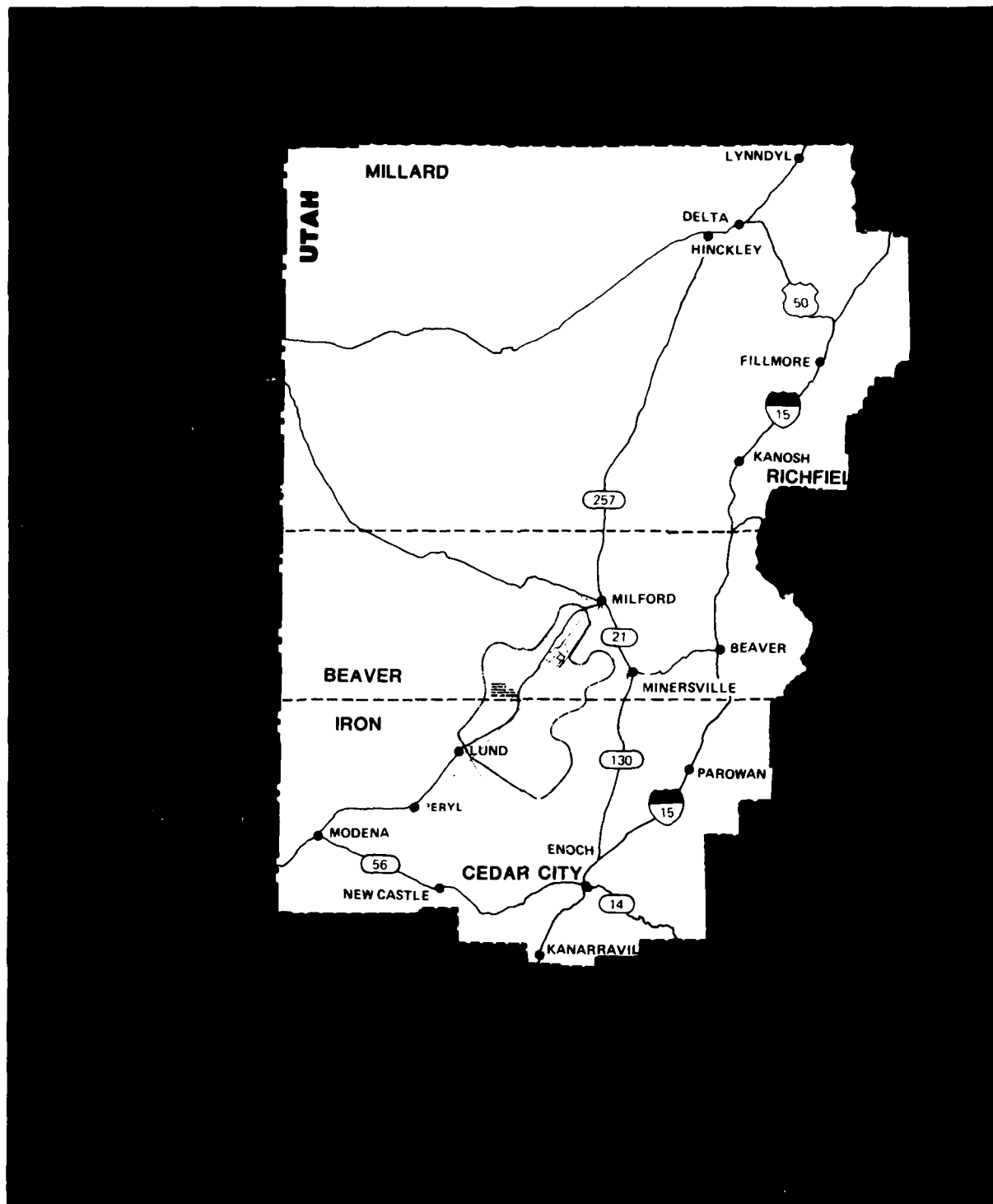
Introduction

The area of analysis (AOA) for the Milford operating base includes Beaver County. The AOA is located in the central section of the designated region of influence (ROI) as shown in Figure 3.4.5-1. Milford and Beaver are the major settlements in the AOA. This section and Chapter 4 detail important environmental characteristics of Milford and vicinity and the proposed base site, respectively.

Beaver county's first settlement was Beaver, founded in 1856 as a Mormon colony. Beaver County economic development in the 19th century followed the same trend as in the other Utah study area counties, early settlement by Mormon colonists followed by the discovery of precious metals, creating mining boom towns. Today, Beaver's economy is dominated by agriculture, including livestock and dairy. Minerals extraction and primary processing are important, including alunite, and gravel, perlite, molybdenum, and geothermal steam.

Quality of Life, Beaver County, Utah (3.4.5.1)

Beaver County had a total population of 4,300 persons in 1978, with the majority of these persons located in Beaver, Milford, and Minersville. Between 1960-1970, Beaver County's population fell by 12.3 percent (U.S. Bureau of Census, 1971). This population decline was largely attributable to young people leaving the area in search of employment opportunities elsewhere. However, between 1970-1977, Beaver County has an average annual growth rate of 1.6, a level below the Utah mean of 2.5 (Table 3.4.1.1-1). Beaver County's population density at 1.7 persons per sq mi, is also much less than the Utah mean of 15.5. In general, people residing in Beaver County tend to be older, stable citizens who appreciate their community and environment. A study of Lewis and Associates (1974), surveyed residents of Beaver County and found a high level of general satisfaction among the population of the communities. The advantages that people mentioned about their community include access to out-of-doors, good place to raise family, friendliness of people, and absence of polluted environment. Disadvantages included the lack of jobs for young people, lack of good shopping centers, lack of cultural refinement, and lack of opportunities for earning a livable income.



4432-C 1

Figure 3.4.5-1. Area of analysis (AOA), Milford.

An examination of the quality of life indicators for public services describe Beaver County's situation as variable (Table 3.4.1.1-1). Health services are adequate, on the whole, with a high number of nurses and dentists per 1,000 population, but a lower number of physicians. Beaver County has less police per 1,000 population than Iron County, but a similar level of social stress as indicated by crime, divorce, and alcoholism rates. Although Beaver County shows a higher suicide rates than Iron County, again there is the problem of the stability of suicide rates for areas of small population.

On a comparative basis, Beaver County education seems to have adequate facilities to meet the needs of the present population. Beaver County is somewhat behind Utah in terms of median school years completed (12.3 years compared to the state average of 12.8). The pupil/teacher ratios show the classrooms to be less crowded than the average class of approximately 25 students for the state.

Beaver County's economic situation is dominated by agriculture, by nonfarm proprietors, state and local government, and trade. The construction sector in Beaver has been one of the fastest growing areas in the economy; followed by manufacturing and services. From 1970 to 1977, the civilian labor force growth rate was 4.1, a moderate level of growth in comparison to other study area counties. Unemployment has been fluctuating as a result of agricultural change, but has been consistently lower than the state mean since 1971. In 1977 though, the unemployment rate at 7.0 was higher than the state level of 5.3. Beaver County has a higher per capita income than its neighbor, Iron County but has 18 percent of its citizen receiving public assistance in comparison to 13 percent in Iron County.

People in Beaver County were asked by Lewis and Associates how they would like to see public funds appropriated. Over 50 percent of the respondents wanted public tax money to be spent on the following: better health and medical services; improved educational facilities; developing local industry; better housing; and recreational opportunities and cultural refinement. Like many small town communities, the citizens of Beaver County would like to see changes occur that would be beneficial to their community, and that would allow more young people to remain in the area. Developing local industry is supported as a method for doing this.

These attitudes are supported by recent finding of Lewis and Albrecht. They selected Beaver County (along with Casibon County in Idaho), for assessing attitudes about economic development and as such have some pertinent data on some of the subjective quality of life indicators (Lewis and Albrecht, 1977). In order to measure attitudes about their communities as they then existed and to assess perceptions concerning the impacts of proposed industrial developments, a survey was conducted by Lewis and Albrecht using a questionnaire, mailed to a random sample of county residents drawn from the telephone directories of all communities in the county. Although the response rate of 42 percent was not very high, the survey does have some statistical validity.

The survey showed that 67 percent of Beaver County residents rated Beaver County communities as an "excellent" place to raise a family, with "good" quality schools (61 percent). However, 99 percent of the residents thought that their communities ranked poor to fair on the availability of jobs; 88 percent ranked their communities as "poor" or "fair" in terms of opportunities for earning income; 90

percent as "poor" or "fair" in terms of suitability of housing; and 82 percent ranked their community as "poor" or "fair" as far as availability of good shopping facilities go (Table 3.4.5.1-1). This seems to reflect the general characteristics of most communities in rural Utah: satisfaction with the lifestyle and access to the outdoors, absence of social pathologies, relatively good schools, but a dearth of employment and other economic advancement opportunities.

Local residents also were asked to assess the kinds of changes that might be expected as result of rapid growth and of the desirability of those changes. A majority of respondents agreed that the positive changes cited in Table 3.4.5.1-2 would occur in these communities as a result of industrial development. At the same time, they believe that there would be an increase in crime and illegal drug use, and major problems in meeting the housing needs of new residents. However, most respondents do not see these adverse effects as making their community a less desirable place to raise a family (Table 3.4.5.1-2).

Lewis and Albrecht conclude that the economic advantages are perceived as overwhelmingly outweighing the disadvantages (Lewis and Albrecht, 1977: 22). A study by Lewis and Associates (1974), generally corroborates this. They found residents of Beaver County to have a high level of general satisfaction with their communities, but dissatisfaction with the lack of jobs for young people, lack of opportunities for earning a livable income, lack of good shopping centers, and lack of cultural refinement. Like many small town residents, the citizens of Beaver County would like to see changes occur that would be beneficial to their area, and that would allow more young people to remain. Developing local industry is supported as a method for doing this (Lewis and Associates, 1974).

Natural Environment (3.4.5.2)

The following sections describe existing characteristics of the natural environment of the Milford Operating Base Vicinity. Topics covered include Water Resources, Erosion, Air Quality, and Biological Resources.

Water Resources (3.4.5.2.1)

General Hydrology

The main aquifer in the Milford study area is the unconsolidated valleyfill deposits. In some areas, highly fractured carbonate rocks constitute a productive aquifer.

Groundwater recharge results from seepage of intermittent streamflow from the surrounding mountains and foothills, and infiltration from irrigation ditches and fields.

Water Availability

Annual water-level data compiled by Mower and Cordova (1974) indicate that water levels declined about 30 ft between 1950 and 1970, with the area of greatest decline centered 7 mi south of Milford. Water-level measurements were made by the U.S. Geological Survey for the period 1935-1955 and 1956-1970. The water-level decline is caused by pumping for irrigation. Based upon the withdrawal and decline

Table 3.4.5.1-1. Attitudes toward local communities, Beaver County, 1974.

Attribute	Percent Rating Beaver as			
	Excellent	Good	Fair	Poor
As a place to raise a family	67	29	4	0
Quality of schools	25	61	14	0
Availability of good jobs	0	1	22	77
Opportunities for earning income	1	16	50	33
Availability of suitable housing	1	9	49	41
Availability of good shopping	5	14	37	45

T4983/9-12-81/F

N = 151

Source: Lewis and Albrecht, 1977, Table 4, p. 25.



Newer residential development in Milford is located on a bluff east of the commercial area. A Milford OB would likely stimulate increased development in the area shown in the foreground of this photograph.

Table 3.4.5.1-2. Predictions of impacts associated with industrialization, Beaver County.

Perceived Positive Impacts	Percent Agreeing
We will have more money for better schools	89
There will be more jobs and employment opportunities available	96
More and better shopping facilities will become available	80
Incomes for local people will improve	88
Perceived Negative Impacts	
There will be an increase in crime and illegal drug use	58
There will be a great deal of pollution that will affect our crops, grazing and recreation areas	9
There will be major problems with meeting the housing needs of new residents	73
The community will become a less desirable place to raise a family.	14

T4984/9-2-81

N = 151

Source: Lewis and Albrecht, 1977, Table 5, p.26.

rates, Mower and Cordova (1974) estimated the total annual recharge to the valleyfill deposits to be 58,000 acre-ft, estimated to be the perennial yield.

Total annual groundwater consumption is 58,000 acre-ft (Price, et al., 1979). Municipal and domestic uses total about 1,000 acre-ft, and the remainder is used for irrigation.

The Portland Cement Association (1966) suggests that water containing less than 2,000 mg/l of total dissolved solids (TDS) is generally satisfactory for mixing cement. All but five water samples from the Milford district meet this criterion. The five wells, which exceed TDS criteria, are all located in the immediate vicinity of Milford.

A more detailed presentation of the hydrology of the Milford area is presented in ETR-12.

Erosion (3.4.5.2.2)

Soils occurring in the area of the Milford OB site are generally poorly developed and have formed on valley bottoms, flood plains, and piedmont slopes. Valley floor and floodplain soils typically have fine textured surfaces, while soils on the piedmont slopes have medium textured surfaces. The water erosion hazard of the soils in the Milford area is moderate due to moderate slopes.

Air Quality (3.4.5.2.3)

Particulate emissions at Milford, excluding windblown sources, are reported as 2,088 tons/yr. Particulate and gaseous emissions are listed in Table 3.4.1.2-2. Recent measured air quality data are not available.

Biological Resources (3.4.5.2.4)

Vegetation And Soils

The vegetation of Milford Valley is typical of valley vegetation of the Escalante Desert, of which this valley forms the northern extent (Fig. 3.4.5.2-1). Saltmarsh vegetation occurs in at least three isolated areas south of Milford and in a larger continuous area in Beaver Bottoms north of Milford. Riparian woodland, characterized by a moderately sparse growth of deciduous trees, is found along the Beaver River north of Minersville. Alkali sink scrub, a vegetation type typical of heavy, saline soils, borders saltmarsh vegetation, separated by a transition zone in which some characteristic species of both vegetation types mix. The northern part of the valley has large expanses of alkali sink scrub on the broad valley floor. Shadscale scrub is also extensive in the northern end of the valley and occurs as a number of subtypes within the proposed OB site. This vegetation type (and its associated subtypes) is much more extensive than any other types of the valley floor, and forms a transition zone between alkali sink scrub and Great Basin sagebrush. Approximately two-thirds of the proposed OB site is within a shadscale subtype dominated by rabbitbrush.

In the upper bajadas, Great Basin sagebrush predominates as a narrow band below pinyon-juniper woodlands. This vegetation type is in greatest abundance

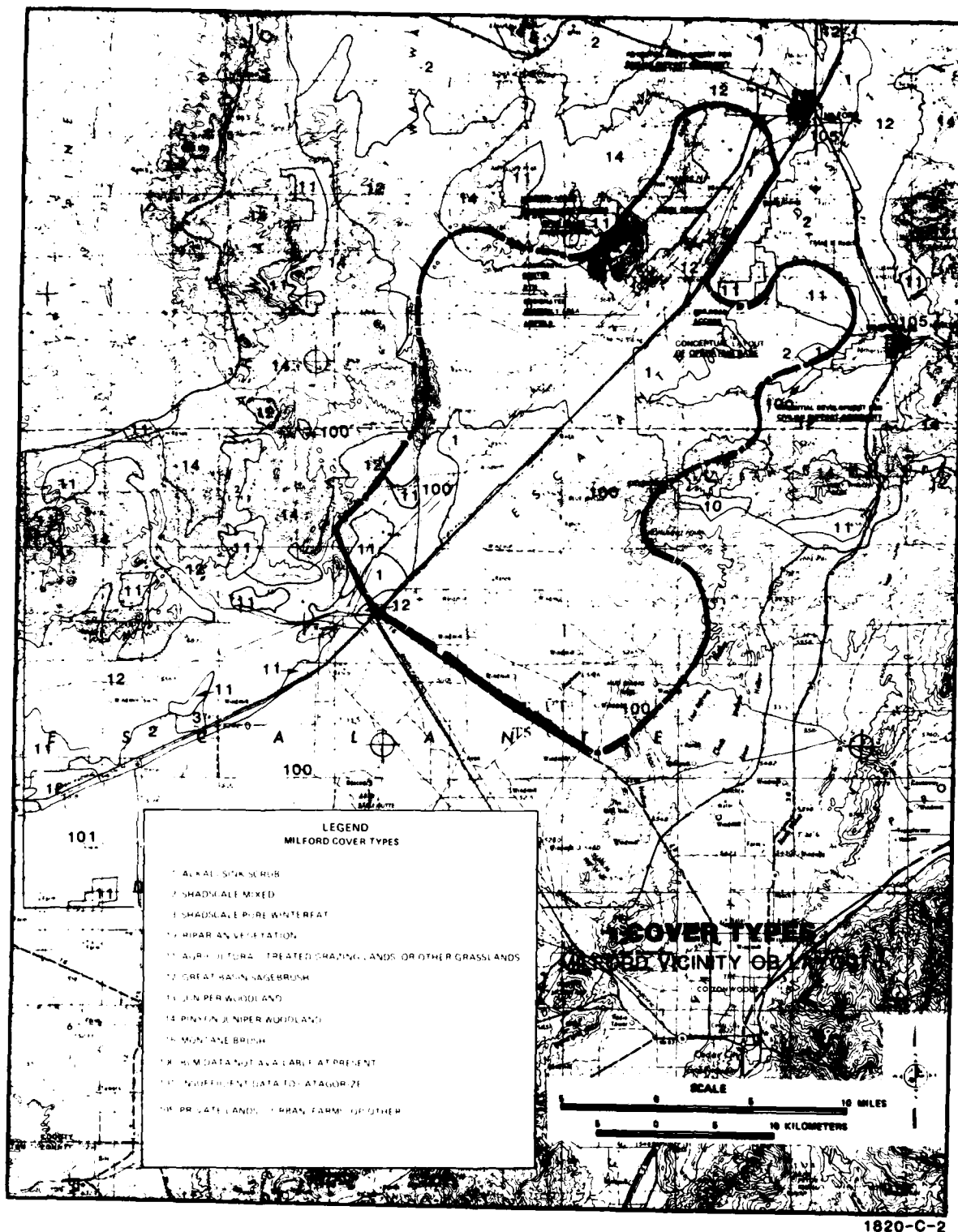


Figure 3.4.5.2-1. Vegetation cover types in the vicinity of Milford.

around Milford; it is limited in extent above the 5,200 ft elevation in the OB site area, and is typically found on deep, permeable, nonsaline soils of the alluvial fans and bajadas slopes. Pinyon-juniper woodland occurs above Great Basin sagebrush on the east and west sides of the valley; it is composed of small evergreen trees, of open canopy, with an understory of big sagebrush.

Scattered throughout the valley floor and bajadas are isolated areas of bunch grass; it is assumed that these represent successful range conversions.

Several soil associations are present. A predominant association is made up of Aridisols, primarily deep, moderately to very strongly alkaline soils. Surface layers are loams, silt loams, and silty clay loams, and the subsoils are fine and fine loamy. Permeability is moderately slow to very slow and slopes are smooth to gently undulating (from less than 1 percent up to 3 percent). On the alluvial fans and low terraces, soils are deep and mildly to strongly alkaline. The surface layers are loams, silt loams, and sandy loams and the subsoils loamy skeletal, fine loamy, fine silty, and sandy. Slopes range from smooth to gently undulating to rolling (from less than 1 percent to nearly 30 percent).

Wildlife

The site is in pronghorn range and contains portions of four key habitat areas. Mule deer are in the mountains of this area, although their numbers are low. Sage grouse occur approximately 8-10 mi east of this base site. Ten to 15 mi to the east is Minersville Lake State Park, a major waterfowl area.

Aquatic Species

No game fishing areas are in the Milford watershed. The adjacent Beaver watershed, 10 to 30 mi southeast of Milford, has game fish habitats (populated by rainbow trout) in Beaver River drainage and Minersville Reservoir.

Protected Species

A bald eagle roost site is a few miles east of Minersville Lake State Park in the Black Mountains and another 10 mi northwest of the site in Wah Wah Valley. A major transplant site of the federally listed endangered Utah prairie dog is located in Pine Valley. The nearest protected or recommended protected aquatic biota occur about 65 mi west of this potential OB location.

Rare Plants

The region of influence identified for Tier IIA study is known to include the following federal candidate species: the dwarf beardtongue (Penstemon nanus), the Tunnel Springs beardtongue (Penstemon concinnus), and the limestone buckwheat (Eriogonum eremicum). The San Francisco mountains, to the west of the suitability zone, are reported to contain a unique habitat type, where the following candidate species are found: the Ostler pepper grass (Lepidium ostleri), the Great Basin fishhook cactus (Sclerocactus pubispinus), and the Frisco clover (Trifolium andersonii var. friscanum). A newly discovered buckwheat (Eriogonum soredium) is reported at the same locality.

A detailed field study is scheduled to identify potential habitat within the region of influence. Refer to ETR-17, Protected Species, for greater detail regarding rare plant habitat.

Wilderness/Natural Areas

Wilderness resources within a 100 air-mile radius of Milford are listed in Table 3.4.5.2-1. Significant natural areas within a 50 air-mile radius are listed in Table 3.4.5.2-2.

Human Environment (3.4.5.3)

The following sections describe baseline socioeconomic and cultural characteristics of the Milford Operation Base Vicinity Environment. Included are: Employment, Income and Earnings, Public Finance, Population, Housing, Community Infrastructure, Traffic and Transportation, Energy, Land Ownership, Land Use, Native Americans, and Archaeological/Historical Resources.

Employment and Labor Force (3.4.5.3.1)

The site for the Milford OB option is in Beaver County, Utah, in the eastern portion of the Nevada/Utah region of influence (ROI). The area of analysis (AOA) for the Milford OB includes Beaver, Iron, and Millard counties. The discussion of employment and labor force for Beaver and Iron Counties appears in Section 3.4.1.3.1 of this chapter. Section 3.4.3.3.1 contains employment and labor force data for Millard County. A detailed analysis of the employment and labor force in the AOA appears in Section 2.1.3.5 of ETR-44. The proposed site is located approximately 10 mi southwest of the town of Milford. Under the proposed action, Milford would be the site of the second OB. Milford would also be the site for the first OB under alternatives 5 and 6. Other potential OB sites are Coyote Spring and Ely, Nevada; Beryl and Delta, Utah; Clovis, New Mexico; and Dalhart, Texas.

Income and Earnings (3.4.5.3.2)

The principal counties potentially affected by location of an operating base in the Milford area are Beaver, Iron, and Millard counties. Recent trends in income and earnings in these counties have been discussed in Sections 3.2.3.2, 3.4.1.3.2, and 3.4.3.3.2.

Public Finance (3.4.5.3.3)

Baseline public finance data for the Beaver and Iron county areas are presented in Section 3.4.1.3.3. Baseline data for Millard County, the city of Delta, and the Millard County School District are presented in Section 3.4.3.3.3.

Population and Communities (3.4.5.3.4)

The area of analysis (AOA) for the proposed operating base near Milford, which would be located in a sparsely settled area of south central Beaver County, includes Beaver, Iron, and a portion of Millard County. The extent of the AOA is determined by the maximum daily commuting zone for direct project employees who would have work locations on the OB. The three counties experienced moderate to

Table 3.4.5.2-1. Wilderness resources within a 100 air-mile (160.9 km) radius from the potential Milford OB site (Page 1 of 2).

State	Wilderness Resources	
	Approximate Miles From OB Site	Approximate Km From OB Site
Nevada		
White Rock Range	43	69
Parsnip Peak	52	84
Table Mountain	58	93
Tunnel Spring	60	97
Highland Ridge	64	103
Fortification Range	68	109
Wheeler Peak	70	113
Grapevine Spring	76	122
Mount Moriah	84	135
Mount Grafton	84	135
Far South Egan	90	145
Granite Spring	94	151
Meadow Valley Mountains	95	153
Weepah Spring	95	153
Mormon Mountains	96	155
South Egan Range	96	155
Utah		
Central Wah Wah Range	20	32
Wah Wah Mountains	31	50
Ashdown Gorge	38	61
Cedar Breaks	40	64
Spring Canyon	41	66
Mountain Home Range	42	68
White Rock Range	43	69
Zion	45	72
Pine Valley Mountain	47	76
Taylor Creek Canyon	48	77
La Verkin Creek Canyon	48	77
King Top	48	77
Bear Trap Canyon	51	82
Deep Creek	54	87
Red Butte	54	87
Goose Creek Canyon	56	90
Red Canyon North	56	90
North Fork Virgin River	57	92
Red Canyon South	58	93
Orderville Canyon	60	97
Tunnel Spring	60	97

T5049/7-23-81

Table 3.4.5.2-1. Wilderness resources within a 100 air-mile (160.9 km) radius from the potential Milford OB site¹ (Page 2 of 2).

State	Wilderness Resources	
	Approximate Miles From OB Site	Approximate Km From OB Site
Utah (continued)		
Notch Peak	61	98
Cottonwood Canyon	64	103
Red Mountain	65	105
Parunuweap Canyon	67	108
The Watchman	68	109
East of Bryce	72	116
The Blues	73	118
Bryce Canyon	69	111
Canaan Mountain	72	116
Paria-Hackberry	78	125
Conger Mountain	77	124
Moquith Mountain	80	129
Swasey Mountain	81	130
Howell Peak	76	122
Wahweap	96	155

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¹ Wilderness resource areas outside the states of Nevada and Utah were not included in this evaluation.

Table 3.4.5.2-2. Significant natural areas within a 50 air-mile (80 Km) radius of the potential Milford OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	Km
Nevada		
None	--	--
Utah		
Steamboat Mountains	25	40
Indian Peak Wildlife Management Area	30	50
Desert Experimental Range	40	65
Desert Range Research Natural Area	40	65

T5075/7-28-81



Milford High School is part of the Beaver County School District. In 1980-81, Beaver County schools operated at an estimated 60 percent capacity.

rapid population growth from 1970 to 1980, varying from a 15.2 percent increase in Beaver to 42.5 percent in Iron (see Table 3.4.5.3.4-1). Detailed information for Iron County is contained in Section 3.4.1.3.5 and for Millard County in Section 3.4.3.3.4.

Beaver County

More than 80 percent of the county's 4,378 residents were in the three incorporated communities--Beaver, Milford, and Minersville. The proposed OB site is closer to the communities of Minersville and Milford, which had 552 and 1,293 residents, respectively, in 1980. Between 1970 and 1980 Beaver and Minersville expanded at a slightly faster rate than the county as a whole while the number of residents in Milford declined slightly. The county as a whole gained fewer than 600 residents during the decade and average population density remains low with 1.7 persons per sq mi in 1980. The county is racially and ethnically homogeneous, with persons of Spanish origin comprising 1.9 percent and Native Americans 0.6 percent of the population. Average household size in the county in 1980 was slightly lower than the state average, with 3.06 persons per household.

Housing (3.4.5.3.5)

Beaver County contained 1,817 housing units in 1980, up from a 1970 total of 1,429 (an average annual growth rate of 2.4 percent). The three incorporated communities of Beaver, Milford, and Minersville together contained 77 percent of the total county housing units, down from 80 percent in 1970 (U.S. Department of Commerce, Bureau of the Census, 1981).

The majority (90 percent) of the dwelling units in the county are single family homes, with less than 5 percent of the stock in mobile homes. Of the multiple family units in the county, over 90 percent are in the communities of Milford and Beaver (M-X Missile Policy Board, 1981).

As of 1980, there were a total of 255 vacant housing units in the county (14 percent of the stock), of which 118 were in Beaver City. There were also 64 vacant lots with access to water (Hammer, Siler, George Associates, 1981).

Between 1970 and 1979, an average of 26 dwelling unit permits have been issued each year, almost all for single unit structures. The cumulative total over this ten-year period was 261 units (U.S. Department of Commerce, Bureau of the Census, 1970 to 1979, inclusive).

Beaver County is projected to experience an average annual rate of growth of its housing stock of 1.4 percent over the period 1982-1994 under trend-growth conditions. This equates to an increase of 295 units from a base in 1982 of 1,598 units. Under high growth conditions the increase amounts to 1,379 units from a base of 2,247 units in 1982 with an average annual rate of growth over the period 1982-1994 of 4.1 percent (refer to Table 3.2.3.4.2-1). These rates of change compare with 2.7 and 2.8 percent, respectively, for trend- and high-growth projections for the deployment region.

Table 3.4.5.3.4-1. Population and population change 1970-1980 by county and community within the Milford OB area of analysis.

County/Community	Population		Change 1970-1980		
	1980	1970	Number	Percent	Annual Rate ¹
Beaver County, Utah	4,378	3,800	578	15.2	1.4
Beaver ccd ²	2,298	-	-	-	-
Beaver city	1,792	1,453	339	23.3	2.1
Milford/Minersville ccd	2,080	-	-	-	-
Milford city	1,293	1,304	-11	-0.8	-0.1
Minersville town	552	448	104	23.2	2.1
Iron County, Utah	17,349	12,177	5,172	42.5	3.6
Beryl/Newcastle ccd	755	557	198	35.5	3.1
Cedar City city	14,031	-	-	-	-
Cedar City city	10,972	8,946	2,026	22.6	2.1
Enoch town	678	120	558	465.0	18.9
Kanarraville town	255	204	51	25.0	2.3
Parowan ccd	2,568	1,900	663	34.9	3.0
Brian Head town	77	-	-	-	-
Paragonah town	310	275	35	12.7	1.2
Parowan city	1,836	1,423	413	29.0	2.6
Millard County, Utah	8,970	6,988	1,982	28.4	2.5
Fillmore ccd	3,254	-	-	-	-
Fillmore city	2,083	1,411	672	47.6	4.0
Kanosh town	435	319	116	36.4	3.2
Meadow town	265	238	27	11.3	1.1

T5127/8-21-81

¹ Annual compound rate of change.

² Census county division.

Source: U.S. Bureau of the Census, Utah Final Population and Housing Unit Counts, (PHC80-V-46), March 1981.

Community Infrastructure (3.4.5.3.6)

Education

In 1980-81, Beaver County School District, with an enrollment of 1,078 students, operated three elementary schools and two junior/senior high schools. Enrollment growth rates have been low, with little or no growth occurring in recent years. Presently, there are 678 pupils in the elementary grades, and 400 pupils in grades 7-12. Fifty-eight teachers are employed in the school district. According to the school superintendent, the present school facilities are utilized below capacity and could accommodate another 718 pupils (Beaver County School District, 1981; M-X Missile Policy Board, 1981).

Health Care

The Beaver Valley Hospital in Beaver City has 20 acute-care beds, and the Milford Valley Memorial Hospital has 14 acute-care and 20 extended-care beds. The hospitals have occupancy rates of 44 and 42 percent, respectively. The Milford Medical Clinic also provides health services. Beaver County has 2 ambulances operated by 20 trained volunteers for 24 hour/day service. Health personnel in the county includes 3 physicians, 2 dentists, and 15 nurses. A psychiatrist is available, whose time is divided among several counties, including Iron, Beaver, and Washington (Beaver Valley Hospital and Milford Valley Memorial Hospital, 1981).

Police Protection

Beaver County sheriff's office provides county-wide coverage 16 hours a day. Police personnel include the sheriff and four deputies, each equipped with a patrol car. One deputy lives in Milford and one in Minersville. Milford also has 2 police officers, each equipped with a patrol car. Beaver City has a police force of three officers and two police cars. Jail facilities include a 2-cell jail in Milford and a county jail facility in Beaver City which can accommodate 12 males.

Fire Protection

Beaver, Milford, and Minersville each have a fire station manned by volunteers. Beaver City has 20 volunteers, and equipment includes a 1,250 gpm pumper, a 500 gpm pumper, a 250 gpm pumper, and a 1,300 gallon tank used as a brush truck. Two ambulances are also housed in the fire station. Milford has 17 volunteers and 3 fire trucks, including a 1,200 gallon tanker, a 750 gpm pumper, and an old truck available if needed. Minersville has two trucks; one is a new 1,000 gpm pumper and the other is a 500 gallon truck. The volunteer fire department is not officially organized. One or two individuals act as fire chiefs for 20-30 relatively untrained firefighters. The town intends to organize soon and provide training to volunteers.

Traffic And Transportation (3.4.5.3.7)

The proposed site is located in an undeveloped area about 20 mi southwest of Milford. There are no paved roads that provide access to the site. The community of Milford is served by state routes 257 and 21, plus other minor county roads. The existing road system in the area is shown on Figure 3.4.5.3-1 along with the 1978 traffic volumes. As shown, the volume of traffic on each of the roads is low.

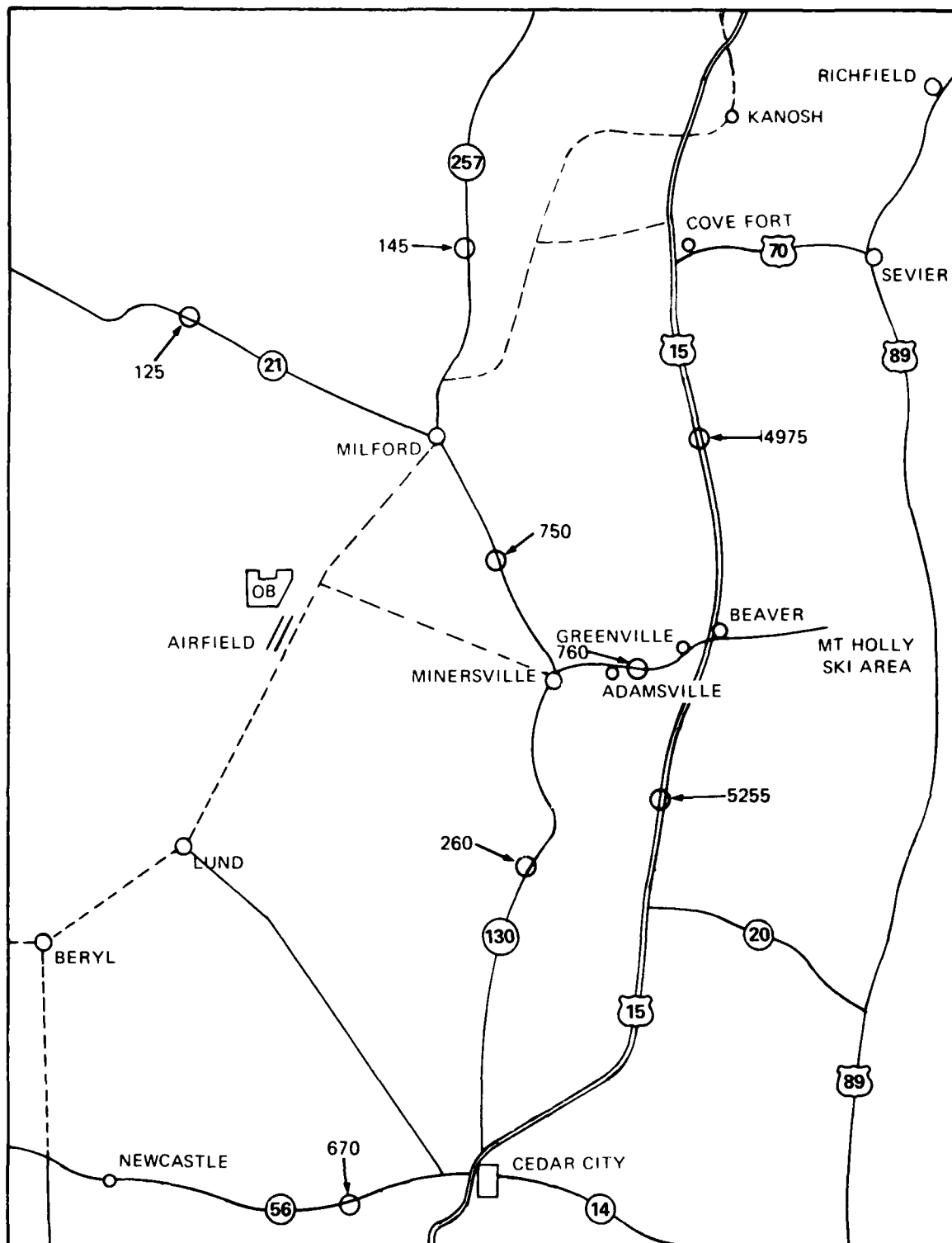


Figure 3.4.5.3-1. Existing roads and traffic in the Milford, Utah area.

The community of Milford lies adjacent to a Union Pacific Railroad line which connects Salt Lake City, Utah and Las Vegas, Nevada. Limited commercial airline service is available at Cedar City.

Energy (3.4.5.3.8)

Milford, Utah has no natural gas service. The proposed Rocky Mountain natural gas pipeline route may pass two mi east of Milford. Presently, home energy requirements are supplied by bottled gas, fuel oil, and electricity. The fuels are trucked in from Las Vegas, Nevada, and Salt Lake City, Utah. Electrical energy is supplied via two 46 kV subtransmission lines. The 500 kV proposed Intermountain Power Project transmission line may pass through the Milford area.

Land Ownership (3.4.5.3.9)

The suitability zone for the potential Milford OB, about 40 percent of which is comprised for BLM land holdings, is located in Beaver County. The state trust lands account for about 10 percent, and private holdings comprise the remaining 50 percent. The closest point of the zone to Milford is about two mi to the southwest, and extends another 28 mi in that direction.

Land Use (3.4.5.3.10)

Urban Land Use

The location of an OB near Milford would impact urban land use primarily in Beaver and Iron counties. Iron County is discussed under the Beryl OB (Section 3.4.1.3.10). Beaver County and its communities are discussed below.

Beaver County

Urban development in the unincorporated portions of Beaver County is guided by a master plan adopted in 1972. The areas covered by the master plan are primarily rural with the exception of four small settlements at Adamsville, Greenville, Manderville, and North Creek. (See ETR-36, "Urban Growth and Planning," for a more detailed discussion of Beaver County land use and an analysis of the conflicts between Beaver County's policies vis-a-vis the M-X project.) The county's zoning ordinance and the most recent version of the county's subdivision ordinance were adopted in 1977.

Urban development in Beaver County is concentrated in three communities in the eastern half of the county: Beaver City, Milford, and Minersville. Beaver City, as noted in Table 3.4.5.3.10-1, is the largest of the communities, with almost 825 acres of land inside city limits. Of this amount, about 62 percent is used for urban development, 6 percent for agriculture, and 32 percent is vacant. A master plan was prepared for Beaver City as part of the planning effort for Beaver County in 1972. The city declined to adopt its portion of the master plan and as a result does not currently have a master plan. The city adopted a brief zoning ordinance covering a portion of the city in 1974 and subdivision regulations in late 1979.

The City of Milford since 1976 has annexed about 40 acres of vacant land bringing the total land area in the city to almost 540 acres. The dominant portion of

Table 3.4.5.3.10-1. Existing land use - Beaver City, Milford, and Minersville Utah.

Land Use	Beaver City		Milford		Minersville	
	Acres	Percent	Acres	Percent	Acres	Percent
Residential	240.3 ¹	29	90.2	17	39.7	9
Commercial	15.0	2	7.0	1	2.4	1
Industrial	0.4	--	8.5	2	--	--
Public	21.1 ²	3	29.8	5	8.5	2
Church/Cemetery	12.3	1	--	--	--	--
Streets	223.3	27	56.7	11	98.6	24
Developed land subtotal	512.4	62	192.2	36	149.2	36
Agriculture	46.1	6	0.7	--	89.9	2
Vacant	264.8	32	345.2	64	174.7	42
Total	823.3	100	538.1	100	413.8	100

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¹Includes 5.7 acres of mobile homes.

²10.1 acres of schools, 11.0 acres of parks.

Sources: Five County Association of Governments, 1978, "Comprehensive Plan for Planning District Five"; Five County Association of Governments, 1980, "Milford Land Use and Housing Elements."

the city, 64 percent or 345 acres as shown in Table 3.4.5.3.10-1, is vacant while only 90 acres are developed for residential purposes. In 1980 the city adopted "Milford Land Use and Housing Elements" prepared by the Five County Association of Governments for guidance in handling future growth. The zoning and subdivision ordinances were adopted in 1974 and 1979, respectively, with the former enforced by the Beaver County building inspector.

Of the three Beaver County incorporated communities, Minersville has the smallest amount of land devoted to urban uses. According to Table 3.4.5.3.10-1 about 42 acres are used for residential and commercial uses. Minersville has reached its current land area of 414 acres through a number of annexations in recent years. Twenty-six acres on the east side of town were added in 1977 and then two parcels totalling 31 acres were annexed in 1978. The town's zoning and subdivision ordinances were scheduled for revision in early 1981, while the master plan was prepared and adopted in conjunction with the county's master plan in 1972.

Agriculture

Although no irrigated croplands exist within the suitability zone identified for the OB, irrigated agriculture has been spreading east of this zone in the vicinity of Milford and Minersville. (see Figure 4.3.3.11-3).

Recreation

Parklands

There are a number of parklands to the east of the Milford/Beaver region (Table 3.4.5.3.10-2). The majority of these parklands are administered by the National Park Service, the Utah Division of Parks and Recreation, and the National Forest Service.

Cedar Breaks National Monument is approximately 50 mi south of Beaver and slightly farther from Milford. Although still farther away, Zion and Bryce Canyon National Parks draw many visitors from the area. These parks provide camping, picnicking, snowmobiling, hiking, and sightseeing opportunities.

Portions of the Fishlake and Dixie National Forests are within a short driving distance of the area (about 50 mi). At least eleven developed campgrounds, two lakes (Panguitch and Kents), with boating and fishing facilities, two snowmobile areas, and three skiing areas: Brian Head, Cedar Canyon, and Mount Holly.

There are three state parks in the Milford/Beaver area: Piute Lake, Minersville Lake, and Otter Creek Lake State Recreation Area. Each of these provides boating, swimming, fishing, and water skiing opportunities.

Snow-Related Recreational Facilities

There are three snow skiing resorts within a day's driving distance of Beaver and Milford. Mt. Holly is just 15 mi east of Beaver and 45 mi from Milford. It has 25 skiable acres and a lift capacity of 1,800/hr. Brian Head and Cedar Canyon ski areas are more than 50 mi to the south, but they combine to 65 skiable acres and a lift capacity of 2,800/hr (UORA, 1976). Sage Valley near Cedar Breaks National Monument and Beaver Canyon near Junction are two favorite areas for snowplay and contain many snowmobile trails.

Table 3.4.5.3.10-2. Recreation sites on the Fish Lake and Dixie National Forest in the vicinity of Milford/Beaver.

Site Name	Activity	Units	+ Miles From Milford/Beaver
Fish Lake National Forest			
Mahogany Cove	Camping Fishing Hunting	7 sites	40/10
Little Cottonwood	Camping Fishing	8 sites	35/5
Little Reservoir	Camping Fishing Hunting	6 sites	40/11
Kent's Lake	Camping Hunting Boating Fishing	17 sites	45/15
Anderson Meadow	Camping Fishing Hunting	10 sites	46/16
City Creek	Camping Fishing Hunting	8 sites	60/30
Castle Rock	Camping Fishing	9 sites	55/35
Shell Oil Site	Camping Fishing	3 sites	65/50
Dixie National Forest			
Vermillion	Camping Fishing Hunting	10 sites	55/40
Panguitch Lake	Camping Fishing Hunting Boating	69 sites	65/50
Red Canyon	Camping Hunting	30 sites	90/50

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¹ Within an approximate 50 mi radius.

Source: Utah Travel Council, undated.

Water-Related Recreational Facilities

Of the developed water recreation sites identified above, the three state parks, Minersville, Piute and Otter Creek, are closer to Beaver/Milford than Panguitch Lake to the south. They offer the same type of facilities, fishing, boating, waterskiing, and swimming. Minersville has 1,130 acres of surface water for recreation, while Piute and Otter Creek have a total of 4,750 surface acres. Panguitch Lake (approximately 50 mi to the south) has 1,234 surface acres and Kents Lake in the mountains east of Beaver has 55 surface acres. Thus, approximately 6,000 acres of water recreation is immediately available to the Milford/Beaver area. Although no developed river-rafting, kayaking or canoeing areas exist, there are a number of mountain creeks and streams that may be used during portions of the year.

ORV and Other Forms of Dispersed Recreation

There are some dune areas north of Milford along Highway 257 that provide opportunities for ORV enthusiasts. One of the largest and most developed ORV parks exists to the north at the Little Sahara Dunes Complex. Although 100 mi from Milford, ORV enthusiasts are more likely to travel this distance for a weekend because of the tremendous draw the Little Sahara area has.

Hill climbing and motorcross areas are not well established in this area. However, pockets of ORV concentration have been identified in the Black Hills area. Those areas immediately surrounding urban centers are often ORV concentration sites. Most of the public lands between Beaver, Minersville, and Milford may be expected to be used for ORV activity.

Recreation Within the Suitability Zone

There are no fishing or developed recreational areas within the OB suitability zone. Since the area is entirely in public domain, it is open to dispersed recreational use, including collecting activities, off-road recreational vehicle use, and small game hunting.

Mining

Oil/gas leases exist near the potential OB site at Milford.

There are silver mining sites located in the Star Mining District west of where an operating base could be located. Several mineral prospects occur along the Western edge of the proposed site. Block mining claims cover most of the site area.

Native Americans (3.4.5.3.11)

Cultural Resources (3.4.5.3.11.1)

The Milford siting area lies within the ancestral territory of the Kwuimpits band of Southern Paiutes. This northernmost band occupied the once game-rich Beaver River Valley. The area under consideration is also within the possible subsistence range of the isolated Indian Peak band of Southern Paiutes. The former Indian Peak Reservation in the nearby Needle Range contains sacred areas and

burials. Descendants of this band are found today in the Cedar City, Kanosh, and Richfield Indian colonies. Sacred sites and hunting/gathering areas for these colonies have been identified in Cedar and Parowan valleys, Fishlake and Dixie national forests, Beaver Dam, and Cedar Mountains. Additional cultural resource data for a Tier II analysis are being gathered in field studies at colonies and reservations in the area.

Native American Land/Water Resources (3.4.5.3.11.2)

Milford lies between the Kanosh and Richfield colonies to the north and the Cedar City Colony to the south. There are currently no reservation lands or Native American communities in the immediate vicinity of the proposed Milford OB site. The Milford suitability zone is, however, within the ancestral territory of the Southern Paiutes. Consequently, projections cannot be made with precision regarding possible impacts until the Interim Tribal Council of the Paiute Indian Tribe of Utah determines the location of their 15,000-acre reservation.

Socioeconomic Characteristics (3.4.5.3.11.3)

Socioeconomic characteristics for Native Americans in the vicinity of the Milford OB are the same as those described for the Beryl OB in Section 3.4.1.3.11.3.

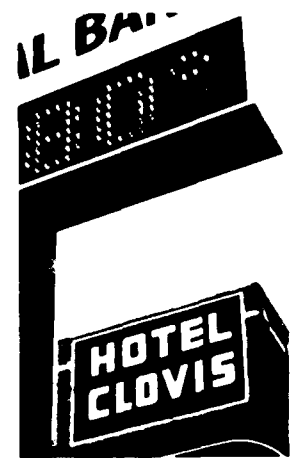
Archaeological and Historical Resources (3.4.5.3.12)

The Milford vicinity zone is located in the Escalante Desert and contains few springs and no drainage that would have attracted prehistoric residential groups. A recent survey within the zone (EDAW 1981b) found a very low density of historic and prehistoric materials including Archaic, Fremont, and Shoshone remains. The western and northern boundary intersects pinyon-juniper covered foothills that contain springs. Higher site densities may be found there. Sites may also cluster around three springs located in the central portion of the vicinity zone. Given the relatively bleak environment, prehistoric sites are likely to be small, and primarily from small groups passing through the desert.

Paleontological Resources

The Milford OB siting area is located on alluvial valley fill in an area that at one time was inundated by Lake Bonneville. Vertebrate fossils have been found in the Bonneville sediments in the Milford area.

Clovis



CLOVIS

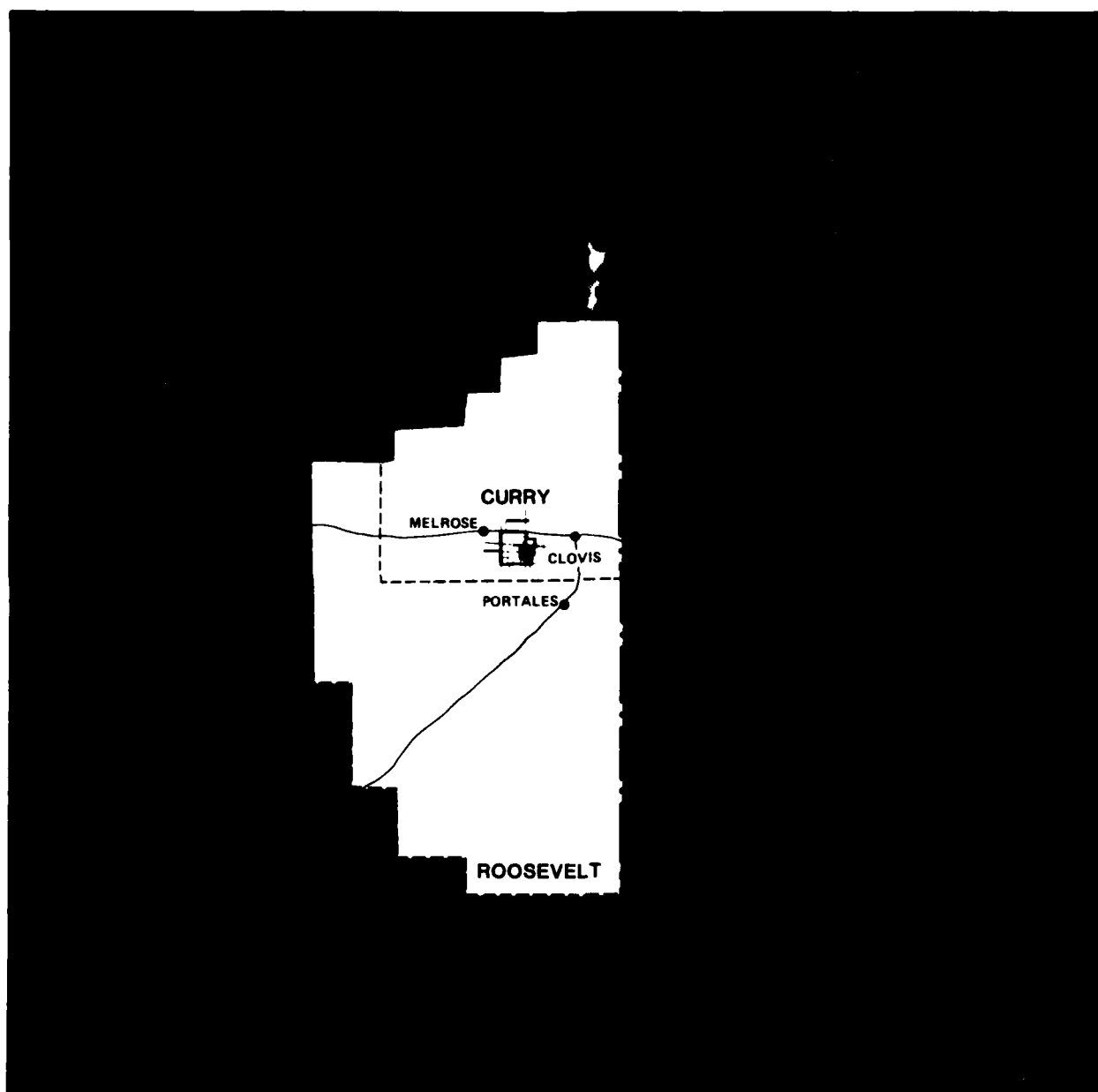
Introduction

The site is ten mi west of Clovis adjacent to Cannon Air Force Base (Figure 3.4.6-1). There are two potential layouts. One is a first OB (Alternative 7), full deployment in Texas/New Mexico. This includes an OB, the existing Cannon Air Force Base airfield, DAA, DTN, OBTS, and a railroad spur. The other is a second OB complex (Alternative 8), split-basing in Nevada/Utah and Texas/New Mexico. This complex is the same as the first except there will be no OBTS. The railroad spur will connect to the A.T. & S.F. Railroad.

The area of analysis (AOA) is Curry County. The AOA is in the south central part of the region of influence (ROI). Clovis and Cannon AFB are the major settlements. This section describes environmental characteristics of Clovis and the AOA.

Quality of Life, Curry County, New Mexico (3.4.6.1)

Table 3.4.6.1-1 presents selected objective quality of life indicators for Curry County, along with comparative data for New Mexico and the United States for comparison. Curry County, with the city of Clovis, has a high population density for New Mexico, with some 31 persons per square mile, over three times the state density. The county, however, grew at a slower pace between 1970 and 1977 compared to the state as a whole. The civilian labor force grew at an even slower pace, 1.1 percent annually, compared to 4.6 percent for New Mexico during the same time period. While Curry County's 1977 unemployment rate, of 4.3 percent was much lower than New Mexico's 7.8 percent, so too was its per capita income, which at \$3,687 was only 63 percent of the state figure in 1977. The proportion of the population on public assistance was lower than the state average, however. The Curry County median value of homes (\$13,025) in 1970 was just below the state figure of \$13,182. There were fewer persons per room in Curry County than in the state as a whole; and the owner-occupancy rate, at 59.4 percent, was a little lower than the state average (Table 3.4.6.1-1).



4431 C

Figure 3.4.6-1. Area of analysis (AOA), Clovis.

Table 3.4.6.1-1. Selected measures of the quality of life, New Mexico (Page 1 of 2).

Indicator	United States	New Mexico	Curry County (Clovis)
Population			
Annual Rate of Growth (1970- 1977)	.9	2.8	2.0
Population Density (1977)	61.1	9.0	31.0
Housing			
Percent of Dwelling Units Owner Occupied (1970)	62.9	66.4	59.4
Percent of Housing Units with More than 1.01 Persons/Room (1970)	8.0	15.3	10.5
Mobile Homes or Trailer as Percent of Housing Units (1970)	4.5	N/A	N/A
Median Home Value (1970)	17,130	13,182	13,025
Economics			
Civilian Labor Force Growth Rate (1970-1977)	2.4	4.6	1.1
Unemployment Rate (1977)	7.0	7.8	4.3
Per Capita Income (1977)	7,026	5,857	3,687
Proportion of Population on Public Assistance (1976)	22.2	20.9	17.6
Health			
Physicians/1,000 Population (1976)	1.7	1.5	0.7
Dentists/1,000 Population (1976)	0.5	0.4	0.5
Registered Nurses/1,000 Population (1976)	4.5	2.6	4.2
Hospital Beds/1,000 Population (1975)	6.6	5.5	3.0
Public Safety			
Police Officers/1,000 Population (1976)	2.8	2.7	2.0
Firefighters/1,000 Population (1968)	2.0	N/A	N/A

Table 3.4.6.1-1. Selected measures of the quality of life, New Mexico (Page 2 of 2).

Indicator	United States	New Mexico	Curry County (Clovis)
Violent Crimes/1,000 Population (1976)	4.0	5.0	2.3
Crimes Against Property/1,000 Population (1976)	45.9	46.9	15.4
Social Stress			
Divorce Rates/1,000 Population (1975)	4.9	7.4	6.3
Suicide Rate/100,000 Population (1976)	12.2	18.3	18.3
Alcoholism Rate/1,000 Population (1976)	42.0	31.6	18.1
Education			
Median School Years Completed (1976)	12.5	12.5	12.2
Pupil/Teacher Ratio	19.5:1	22.1:1	22.3:1

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Sources: Architects and Planners Alliance, Inc., 1979; Bureau of Economic and Business Research, 1979; De Chiasa, J. and L. Koppelman, 1975; Four Corners Regional Commission, 1979; Golden, J. et al., 1979; Nevada Department of Education, 1979; Nevada Office of Health Planning and Resources, 1977; Nevada Office of Planning Coordination, 1978; U.S. Department of Commerce, 1978 and 1979; U.S. Department of Commerce, Bureau of the Census, 1973 and 1978; U.S. Department of Justice, 1977.

The public health services indicators show that Curry County had 0.7 physicians, 0.5 dentists, 4.2 registered nurses, and 3.0 hospital beds per 1,000 inhabitants in 1976. These were below the state figures for the ratio of physicians and hospital beds, but about the same dentists and nurses. In the public safety area, Curry County has fewer police officers than the state per 1,000 population, and also lower crime rates. Violent crimes averaged 2.3/1,000 population, less than half the figure for New Mexico as a whole, and crimes against property, at 15.4/1,000 population were also below both New Mexico's and the nation's figure. In regard to social stress indicators, the county also fared better than the state, with a lower divorce rate (6.3/1,000 population) and a lower alcoholism rate 18.1/1,000 population; however, the suicide rate of 18.3/1,000 population was the same as New Mexico's. In the education area, the median number of school years completed was just below the figure for the state, and the pupil/teacher ratio was a little higher (Table 3.4.6.1-1).

Natural Environment (3.4.6.2)

The following sections describe existing characteristics of the natural environment of the Clovis Operating Base Vicinity. Topics covered include Water Resources, Erosion, Air Quality, and Biological Resources.

Water Resources (3.4.6.2.1)

Generally, the site is very limited for surface water use because of the sparse rainfall and distance to major stream channels. Moreover, most of the stream flow in the region is allocated through the water rights process. Generally, due to the absence of defined drainage channels and the even, relatively level topography, no significant flood hazard conditions exist within this area.

The Ute Reservoir, about 75 mi to the north, presents the greatest potential for obtaining surface water. The water in the 110,000 acre-ft reservoir is under the jurisdiction of the New Mexico Interstate Stream Commission and is under study by the U.S. Bureau of Reclamation for enlargement to 270,000 acre-ft. The enlargement project will depend upon cost and finding a market for the water. The initial yield would be 25,000 acre-ft per year, but on a 50-year projection the long-term dependable yield would be 15,000 acre-ft due to revised hydrological conditions based on a recent dry cycle, and a long-term reduction in reservoir capacity due to siltation (Muntz, 1981).

The major proposal for the Ute Reservoir water supply is contained in the U.S. Bureau of Reclamation's 1972 Eastern New Mexico Water Supply Project Feasibility Report. As envisioned in this document, water would be pumped about 1,500 ft in two lifts and transported to the southeast corner of the state, delivering water along the way. The Feasibility Report was followed by an Environmental Impact Statement in 1976. Because of cost, a shorter system was proposed in the mid-70's to serve five communities: Tucumari, San Jon, Clovis, Texico, and Portales. The 50-year water demand for these communities was set at 20,000 acre-ft per year. Local support for the project is uncertain. Hearings necessary to authorize local repayment of construction bonds have not been held for a lack of support (Tharp, 1981). The project has not been authorized or funded by Congress (Cosper, 1981).

The latest cost estimate for the project (serving the five communities) was carried out in July 1977. Construction cost was set at \$74 million with an annual

operation and management cost of \$1.5 million. The estimated water cost was \$420 per acre-ft. These costs will probably exceed \$500 per acre-ft, at today's prices, while groundwater pumping costs in the area vary from \$20-\$50 per acre-ft (Dixon, 1981).

The sole source of groundwater in the vicinity of the Clovis OB site is the Ogallala Formation. The Ogallala Formation is recognized as one of America's major aquifers. It underlies eastern New Mexico and western Texas and extends to the north beneath the high plains of Colorado, Oklahoma, Kansas, and Nebraska. This aquifer contains billions of gallons of water in storage, but existing use is far in excess of the natural rate of recharge.

In the vicinity of the Clovis site the Ogallala Formation extends to depths ranging from 300 to 450 ft below the land surface.

The formation can be characterized as a poorly consolidated sandstone, which ranges from fine to medium grained sand in the upper section, to a coarser sand and gravel in the lower section (Kelley and Trauger, 1972).

The water contained in the Ogallala Formation has been stored there for thousands of years. Generally, the amount of recharge to the groundwater is derived from the deep downward percolation of precipitation that is not consumed by evapotranspiration near the land surface (Galloway and Wright, 1968).

Water Availability

The yield that can be sustained from this system is dependent upon the amount of water in storage and the rate at which the stored water is depleted or mined. With multiple users extracting water from the same source, estimates of length of time that this groundwater source can be relied upon are necessarily dependent upon the quantities pumped by the other users. If historic trends continue, the Ogallala Formation may be depleted within the next 40 years, without the added withdrawals imposed by the M-X project. However, the lowering of the water table and increased pumping costs have resulted in an overall reduction of withdrawals for irrigation.

The groundwater supply available for utilization in the Clovis area is limited largely to stored water. Any consumptive use of groundwater will cause a depletion in the amount of stored water and result in a decline of the local water table. Existing pumping of the groundwater for irrigation and municipal supply has produced a continuous decline of the water table as the groundwater resource has been mined.

Information presently available on the saturated thickness of the Formation indicates that there is approximately 135,000 acre-ft of water directly underlying the boundaries of the site. If this water is extracted at a rate of 5,000 acre-ft per year, theoretically, the supply will be totally depleted in 27 years. This 27-year calculated "life expectancy" of a groundwater supply from the Ogallala is presented to indicate the very limited and nonrenewable nature of this resource. The actual "life" of the groundwater source may vary significantly from what has been calculated.

Groundwater in Curry County is used for agricultural irrigation, livestock watering, urban and military water supplies, manufacturing and rural water supplies. The largest depletions are caused by irrigation of approximately 200,000 acres of land. This single use consumes over 90 percent of all water withdrawn from storage in the aquifer. The depletion calculated for 1970 was 160,800 acre-ft; the depletion estimated for 1980 was 162,700 acre-ft. The second largest portion withdrawn is for urban and rural water supplies, but this accounts for less than 5 percent of the total depletion (NMISC and NMSEO, 1975).

A more detailed presentation of the hydrology of the Clovis area is presented in ETR-12.

Erosion (3.4.6.2.2)

The principal soils of the proposed Clovis OB site have medium or sandy textures and have formed on gently rolling uplands. These soils are moderately to highly susceptible to water and wind erosion.

Air Quality (3.4.6.2.3)

A summary of some climatological conditions influencing air quality is in Table 3.4.1.2-1. Clovis is located in Curry County. Particulate and gaseous emissions for this county are given in Table 3.4.1.2-2. Total particulate emissions for Curry County were 1,510 tons per year. Visible dust is a problem, particularly in March and April, when it occurs 6 percent of the time.

Biological Resources (3.4.6.2.4)

Soils of the regions in consideration belong predominantly to the Amarillo and Clovis series. Slopes average less than 2 percent and may range up to 5 percent. The soils are moderately deep and well-drained, and have fine sandy loam and loamy fine sand surface textures underlain by a lime-enriched zone.

The potential OB complex could utilize Cannon Air Force Base and adjacent land which is presently used for agriculture. There is very little natural vegetation in the area. The wildlife species are common to agricultural areas throughout the region, and include bobwhite quail and pheasant. There are no aquatic habitats. There are no protected animal species reported in the area, although the protected Central Plains milk snake, the Texas horned lizard, and migrating birds of prey may be present. No protected plants have been reported.

The closest wilderness resource is the Salt Creek Wilderness, located approximately 80 mi southwest of the proposed Clovis OB site. The nearest significant natural area is Grulla National Wildlife Refuge, approximately 25 mi to the southeast (Table 3.4.6.2.4-1). Extensive sandhills are found between the Refuge and the site. There are few biologically sensitive areas. There are some playa lakes scattered in the area which are used by upland game for cover, by waterfowl for resting and feeding, and by wildlife in general for water.

Table 3.4.6.2.4-1. Significant natural areas within a 50 air-mile (80 km) radius of the potential Clovis OB site.

Significant Natural Area	Approximate Distance from OB site	
	Miles	Km
Texas		
Muleshoe National Wildlife Refuge	45	70
New Mexico		
Grulla National Wildlife Refuge	25	40
Claudell Wildlife Management Area	35	55
Mescalero Escarpment	40	65
Liberty Wildlife Management Area	40	65
Marshall Wildlife Management Area	50	80
Gallena Tracts Wildlife Management Area	50	80
Blackhills Wildlife Management Area	50	80

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No federal candidate rare plants are reported from the area. Other sensitive plant species may be identified by site-specific work.

Human Environment (3.4.6.3)

The following sections describe baseline socioeconomic and cultural characteristics of the Clovis Operation Base Vicinity Environment. Included are: Employment, Income and Earnings, Public Finance, Population, Housing, Community Infrastructure, Traffic and Transportation, Energy, Land Ownership, Land Use, Native Americans, and Archaeological/Historical Resources.

Employment and Labor Force (3.4.6.3.1)

The site for the Clovis OB option is in Curry County, New Mexico, in the central part of the Texas/New Mexico region of influence (ROI). The area of analysis (AOA) for the Clovis OB consists of Curry and Roosevelt counties. A detailed analysis of the employment and labor force in the AOA is found in Section 2.1.3.6 of ETR-44. Clovis and Cannon AFBs are major activity centers within the AOA. The Clovis OB would be built at the site of Cannon AFB, with significant extension of its boundaries. Clovis would be the site of the first OB under Alternative 7 (full Texas/New Mexico deployment) and the second OB under Alternative 8 (split deployment). Other potential OB sites are at Coyote Spring and Ely, Nevada; Delta, Beryl, and Milford, Utah; and Dalhart, Texas.

Employment in Curry County is dominated by the government sector. Much of this employment is related to Cannon AFB. Other significant employment sectors are services, manufacturing, and agriculture. Although the agricultural sector provides only 6 percent of the employment in Curry County, farming is, nevertheless, an important part of the area's economy. Over 95 percent of the land in the county is devoted to agriculture, two-thirds of which is cropland and the other one-third range. Curry County produces more corn, wheat, and sorghum than any other county in New Mexico. The economy of Roosevelt County is similar to that of Curry County, dependent mainly on the agricultural and government sectors.

Recent Labor Force Trends

Curry County

The labor force in Curry County grew from 11,400 in 1968 to 15,100 in 1977, and then declined to 14,400 in 1980. This represents an increase in the labor force of 26 percent between 1968 and 1980. Employment levels in the county shadowed the labor force trends during this period, increasing from 11,100 workers in 1968 to 13,500 in 1980. The highest level of employment occurred in 1978 when 14,285 workers living in the county were employed. County unemployment levels were particularly high in 1972, 1975, and 1980 when 630, 1,030, and 900 persons were without work in those respective years. The unemployment rate averaged 6.0 percent between 1975 and 1980.

Roosevelt County

The labor force in Roosevelt County increased from 6,200 persons in 1968 to 7,300 in 1980, and peaked in 1978 when 7,500 persons were either working or looking for work. The county employment level also peaked during 1978 at 7,200. In 1980, 7,000 county residents were employed.

Unemployment levels were highest during 1970, 1971, and 1975, when 354, 366, and 329 persons in Roosevelt County were without work. These were the only 3 years that the unemployment rate was above 4.3 percent. In 1980, 263 persons in the county were unemployed, comprising 3.6 percent of the labor force.

Projected Employment

Employment projections for Curry and Roosevelt counties are presented in Section 3.3.3.1.2.1. No sector-specific employment projections at the county level were available to use in this analysis for Curry and Roosevelt counties.

Income and Earnings (3.4.6.3.2)

The counties potentially most affected by location of an operating base in the Clovis area are Curry and Roosevelt Counties. Detailed baseline earnings data can be found in ETR-3C.

Curry County

Total earnings in Curry County amounted to \$214.7 million in 1979. The government sector (principally due to the military payroll associated with Clovis Air Force Base) is the major earnings source in the county (37.2 percent of all earnings generated in the county in 1979). Retail trade, service, transportation, and public utilities earnings follow with 13.6, 12.0, and 11.8 percent of total county earnings, respectively in 1979. Earnings (wage and salary disbursements) per worker in the county stood at \$10,675 in 1979 compared to the state average of \$11,658 in 1979, and have been consistently below the state average since 1967. While the county has enjoyed a relatively healthy economy in recent years, this may be attributed to a continued military presence.

Personal income per capita levels are relatively strong and generally have been above state levels, except during 1977 and 1979 when farm proprietor's income dropped substantially from historical levels.

Roosevelt County

Total earnings in Roosevelt County amounted to \$69.5 million in 1979. Agricultural earnings are the major earnings source in the county, accounting for almost one-third of total 1979 county earnings. Earnings generated in the government sector, principally in state and local government, are the other major categories. Earnings per worker are lower than both state and U.S. averages. Earnings (wage and salary disbursements) per worker in Roosevelt County in 1979 stood at \$9,418 compared to the state average of \$11,658 and \$12,884 in the United States.

Per capita income levels in the county tend to be below average. They amounted to \$6,539 in 1979, compared to the state average of \$7,483 and the U.S. average of \$8,757.

Public Finance (3.4.6.3.3)

Revenue structures, expenditure patterns, and fiscal capacities vary widely among the jurisdictions in Curry and Roosevelt counties. This section presents budgetary information for Curry County, Roosevelt County, and the cities of Clovis and Portales as a measure of local government's ability to absorb growth.

Property taxes are the largest source of local revenues in Curry County at 74.6 percent of total general fund revenues for the FY 1977-78 to FY 1979-80 period (see Table 3.4.6.3.3-1). Additional baseline data are presented in a supplemental technical report ETR-3C. New Mexico allocates additional funds to local governments that are earmarked for specific programs. The Road Fund, consisting of gasoline tax revenues, and the Revenue Sharing Fund combined account for 41.6 percent of the total of all fund revenues (New Mexico Department of Finance and Administration, 1980a). The general fund accounts for the remainder of all fund revenues with a 53.3 percent share of total revenues. Total revenues have increased at a modest annual average rate of 4.5 percent during the three year time frame. All funds except the Revenue Sharing Fund grew at approximately 7.0 percent annually. Revenue Sharing Fund experienced a 17 percent decrease during FY 1977-78 to FY 1979-80.

Fiscal structure in the city of Clovis differs from that of Curry County. As indicated in Table 3.4.6.3.3-1, property tax revenues comprised only 4.1 percent of general fund revenues for FY 1976-77 through FY 1979-80 while intergovernmental transfer funds (primarily from the Gross Receipts Tax) accounted for 69.2 percent. The Gross Receipts Tax of 1 percent of taxable retail sales grew at a rate of 14.0 percent over the four years and property tax revenues grew at 6.5 percent. This has resulted in an increased dependence on non-local revenues sources. Consequently, future fiscal constraints by state and federal governments could cause localized fiscal imbalances for Clovis. Other revenues funds available for Clovis consist primarily of the Revenue Sharing Fund and the Utility Fund.

General government expenditures accounted for 72.1 percent of total all-fund expenditures for Curry County and 94.1 percent for Clovis during the three-year study period. Earmarked funds, primarily the Road Fund, Revenue Sharing Fund, and Fire District Fund, account for the remainder of total all-fund expenditures.

Revenue and expenditure growth patterns for Roosevelt County and the city of Portales are also presented in Table 3.4.6.3.3-1. Property tax revenues are the largest source of local revenues in Roosevelt County, comprising 51.7 percent of general fund revenues for FY 1977-78 to FY 1979-80. This is considerably lower than in Curry County. Decreased revenues from property taxes are recouped through the Oil and Gas Production and Equipment Tax, which accounted for 16.1 percent during the study period. Additionally, the share of revenues from property taxes has decreased from 55 percent in FY 1977-78 to 44 percent in FY 1979-80, while the Oil and Gas Tax has increased from 13.3 percent to 21 percent during the same period. The general fund accounted for 41.0 percent of total all-fund revenues,

Table 3.4.6.3.3-1. Recent average annual growth rates and percentage shares of specific revenues and expenditures by category, for Curry and Roosevelt counties and selected communities.

	Total Revenues		Property Tax Revenues		Intergovernmental Transfers		Total Expenditures		Public Safety Expenditures	
	Annual Rate ¹		Annual Rate	Percent of Total Revenues	Annual Rate	Percent of Total Revenues	Annual Rate		Annual Rate	Percent of Total Expenditures
Curry County	7.4		5.8	74.6	-4.0	11.7	7.6		21.6	27.9
Roosevelt County	16.7		3.9	51.7	15.9	8.9	13.3		30.0	26.7
Clovis (Curry County)	10.7		6.4	4.1	13.1	69.2	5.8		N/A	N/A
Portales (Roosevelt County)	7.1		4.6	3.3	1.6	66.4	11.6		N/A	N/A

T5471/9-10-81

¹ Annual compound rate of change.

Source: HDR Sciences.

and the earmarked local funds and the Revenue Sharing Fund constituted 45.7 percent.

Total revenues in Roosevelt County have increased at an average annual rate of 16.7 percent during the last three years. All funds, except the Revenue Sharing Fund experienced positive growth rates. The Revenue Sharing Fund, reflecting tighter federal fiscal constraints has decreased at a 19.7 percent annual average rate during FY 1977-78 through FY 1979-80.

The city of Portales relies heavily on state-shared revenues, and receives little revenue from property taxes. Property tax revenues comprise only 3.3 percent of general fund revenues, while intergovernmental transfer funds (primarily from the Gross Receipts Tax) account for a significant 53.9 percent of the general fund (New Mexico Department of Finance and Administration, 1980a).

General government expenditures account for 73.3 percent of total general fund expenditures for Roosevelt County and 94.1 percent for Portales. Earmarked funds, primarily the Road Fund, Revenue Sharing Fund, and Fire District Fund account for the remainder of total all fund expenditures.

School district revenues and expenditures follow similar patterns to those in other school districts New Mexico. Table 3.4.6.3.3-2 presents growth rates for the operational fund and all funds for Portales and Clovis school districts. ETR-3C presents additional baseline data for selected New Mexico school districts. From FY 1975-76 to FY 1979-80, instruction expenses were the largest single outlay of operational fund expenditures, at approximately 66.5 percent for Clovis and 46.4 percent for Portales. Fixed charges and operation and maintenance of the physical plant accounted for another 22 percent of operation expenditures. Operational expenditures constitute approximately 80 percent of total all-fund expenditures. The Building Fund, Debt Service Fund, and miscellaneous funds comprise the remainder. Revenue sources for both school districts were principally from state and local contributions. The state contributed 83.8 percent of total revenues for the Clovis School District during 1975-76 to 1979-80 fiscal years. Local sources contributed 7.8 percent of operational fund revenues. In the Portales School District the state also contributed heavily at 91.2 percent. Local contributions accounted for 7.2 percent of school district revenues. Operational revenues constitute approximately 80 percent of total all-fund revenues. The Building, Debt Service and Federal Projects funds comprise the remainder. Operations fund expenditures, 11.1 percent per year, have grown slightly more quickly than the 10.7 percent per year growth rate of revenues in Clovis over the FY 1975 - FY 1980 period. In Portales on the other hand, the growth rate for operations fund revenues of 11.7 percent was well above operations fund expenditures annual growth of 10.2 percent over the same period.

Table 3.4.6.3.3-3 presents assessed value, indebtedness level and reserve bonding capacity for Curry and Roosevelt counties, Clovis and Portales Independent School districts and the cities of Clovis and Portales. Indebtedness levels are limited to 4 percent of assessed valuation of each taxing entity. Local governments in Clovis and in the vicinity have sufficient resources to support low to moderate growth. As budgets and reserve bonding capacities in these jurisdictions are relatively low, their ability to support large-scale rapid growth is limited.

Table 3.4.6.3.3-2. Percentage growth rates for school district revenues and expenditures for Clovis and Portales school districts, FY 1976-76 to FY 1979-80.

School District	Operation Fund Revenues	Operation Fund Expenditures	All Funds Revenues	All Funds Expenditures
Clovis	10.7	11.1	6.8	9.1
Portales	11.7	10.2	12.2	13.1

T5465/9-3-81

Source: HDR Sciences.



The Clovis Public School System operates 12 elementary schools, 3 junior high schools, and 1 senior high school. Some crowding exists at the senior high school level.

Table 3.4.6.3.3-3. Assessed valuations, indebtedness limitations and revenue bonding capacity for taxing jurisdictions in Clovis OB Region, 1980-81.

Jurisdiction	Assessed Value	Indebtedness Limitation	Outstanding General Obligation Bonds	Reserve Bonding Capacity
Curry County	109,401,770	4,376,070	0	4,376,070
Clovis School District	93,386,374	3,735,455	2,880,000	855,455
City of Clovis	74,094,301	2,961,772	1,000,000 ¹	1,961,772 ¹
Roosevelt County	63,452,018	2,538,080	965,000	1,573,080
Portales School District	28,049,975	1,121,999	300,000	821,999
City of Portales	17,798,716	711,949	0	711,949

T5466/9-22-81/F

¹Includes \$800,000 of G.O. Bonds that will be retired from sources other than property tax.

Source: New Mexico Department of Finance and Administration, 1981. New Mexico Local Governments and The Property Tax, FY 1980-81.



Clovis is a commercial center for surrounding agriculture, Cannon AFB, and federal offices. This rain monitoring equipment is outside the federal building.

Population and Communities (3.4.6.3.4)

The area of analysis (AOA) for the proposed OB near Clovis and Cannon AFB in south-central Curry County includes Curry and Roosevelt counties in New Mexico and Parmer and Bailey counties in Texas. The extent of the AOA is determined by the maximum daily commuting zone for direct project workers who work at the OB. As is evident from Table 3.4.6.3.4-1, these counties had virtually stationary populations during the past decade, with modest population increases in Curry and Parmer and slight decreases in Roosevelt and Bailey.

Curry County

About three-quarters of the county's 42,019 residents were within the city of Clovis, which had a population of 31,194 in 1980. Other incorporated places include Texico, about 15 mi to the east, and Melrose, 15 mi to the west of the proposed OB site. The county experienced slow population growth between 1970 and 1980, adding about 2,500 residents for an annual rate of change of 0.6 percent compared to 2.5 percent for the state as a whole. The county is the most densely settled of those within the AOA with an average of about 30 persons per sq mi in 1980. The population of the county is relatively diverse in its racial and ethnic composition, with persons of Spanish origin comprising 19.5 percent and blacks 6.8 percent of the residents in 1980.

Roosevelt County

Roosevelt, located immediately south of Curry County, had 15,695 residents in 1980, a decline of 784 or 4.8 percent since 1970. The principal community is Portales, whose 9,940 residents constituted about 60 percent of the county's population. The county is sparsely settled with an average of 6.4 persons per sq mi in 1980.

Parmer and Bailey Counties, Texas

These two counties, which had 11,038 and 8,168 residents, respectively, in 1980, are located just east of the state line in Texas. Their populations were virtually stationary between 1970 and 1980, with a slight gain of 5.0 percent in Parmer and a loss of 3.8 percent in Bailey. The largest communities are Muleshoe (4,842) in Bailey and Friona (3,809), Bovina (1,499), and Farwell (1,354) in Parmer County. Average population densities are 12.8 and 9.8 persons per sq mi in Parmer and Bailey, respectively.

Housing (3.4.6.3.5)

Between 1970 and 1980, Curry County experienced an addition of 3,812 dwelling units to its housing stock of 12,401. This increase amounted to an average annual growth rate of 2.7 percent. The largest concentration of housing is in Clovis, which contains 78 percent of the county housing stock. The other communities of Texico, Melrose and Grady contain 745 dwelling units (4.6 percent of the total), leaving 17.5 percent of the housing units in rural areas (U.S. Department of Commerce, Bureau of the Census, 1981). In 1979, of the total number of housing units in the county, 17 percent were mobile homes.

Table 3.4.6.3.4-1. Population and population change 1970-1980 by county and community within the Clovis OB area of analysis.

County/Community	Population		Change 1970-1980		
	1980	1970	Number	Percent	Annual Rate ¹
Bailey County, Texas	8,168	8,487	-319	-3.8	-0.4
Muleshoe ccd ²	6,889	6,816	73	1.1	0.1
Muleshoe city	4,842	4,525	317	7.0	0.7
Curry County, New Mexico	42,019	39,517	2,502	6.3	0.6
Broadview ccd	469	620	-151	-24.4	-2.8
Grady village	122	104	18	17.3	1.6
Clovis ccd	40,455	-	-	-	-
Clovis city	31,194	28,495	2,699	9.5	0.9
Texico city	958	772	236	24.1	2.2
Melrose ccd	1,095	1,121	-26	-2.3	-0.2
Melrose village	649	6,326	13	2.0	0.2
Parmer County, Texas	11,038	10,509	529	5.0	0.5
Farwell/Bovina ccd	5,744	5,603	141	2.5	0.2
Bovina city	1,499	1,428	71	5.0	0.5
Farwell city	1,354	1,185	169	14.3	1.3
Friona ccd	5,294	4,906	388	7.9	0.8
Friona city	3,809	3,111	698	22.4	2.0
Roosevelt County, New Mex.	15,695	16,479	-784	-4.8	-0.5
Portales ccd	13,572	-	-	-	-
Portales city	9,940	10,554	-614	-5.8	-0.6

T5130/8-21-81

¹ Annual compound rate of change.

² Census county division.

Sources: U.S. Bureau of the Census, New Mexico Final Population and Housing Unit Counts, (PHC80-V-33); Texas Final Population and Housing Unit Counts, (PHC80-V-45), March 1981.

Over the period 1970-1979, there has been an annual average of 259 dwelling unit permits issued in the county. The yearly total has varied between a low of 199 (1974) and a high of 322 (1972). The majority of the units are single family structures which have made up between 64 and 95 percent of the dwelling units authorized for construction annually (U.S. Department of Commerce, Bureau of the Census, 1970 to 1979, inclusive).

Roosevelt County experienced a modest average annual growth rate in the housing stock of 1.2 percent between 1970 and 1980. The largest concentration of housing is in the community of Portales, which contains 85 percent of the county dwelling units. This community, in comparison to others in the county (Causey, Dora, Elida, and Floyd), experienced positive growth over the decade (U.S. Department of Commerce, Bureau of the Census, 1981).

Curry County is not projected to experience any growth over the period 1982-1994.

Roosevelt County is projected to experience an average annual rate of growth of its housing stock of 0.4 percent over the period 1982-1994 under trend-growth conditions. This equates to an increase of 366 units from a base in 1982 of 6,760 units (refer to Table 3.3.3.4.2-1). This rate of change compares with 1.0 for the deployment region.

Community Infrastructure (3.4.6.3.6)

Education

The Curry County schools have a total expected 1981 enrollment of 8,646 students. The total number of teachers equals 522. The Clovis public school system operates 12 elementary schools, 3 junior high schools, and 1 senior high school. In addition, the communities of Grady, Melrose, and Texico each have a school containing grades K-12. Curry County schools could at the maximum accommodate an additional 2,500 students, although there is some crowding at the senior high school level. Plans to expand schools of all grade levels are in progress (Clovis, Grady, Melros, and Texico School Districts, 1981).

There are 4 school districts in Roosevelt County. The largest is Portales, with 4 elementary schools, 1 junior high, and 1 senior high school. The total 1980-81 enrollment for the county's 9 schools was 2,989. Teachers numbered 181. Schools are generally in excellent condition, and the county can accommodate another 860 students (Portales, Floyd, Elida, and Dora School Districts, 1981).

Health Care

The Clovis High Plains Hospital and several other health clinics serve Curry County. The hospital, built in 1978, has a 106 acute-care bed capacity and has a utilization rate of 65 percent. Cannon Air Force Base operates a 100-bed hospital in Portales. Health personnel serving the county include 25 doctors, 130 nurses, 13 dentists, 26 mental health workers, and 63 emergency medical technicians. Rescue vehicles operate from Clovis and Cannon Air Force Base; 8 ambulances are located at the Clovis Hospital, and 4 are with the Clovis Fire Department (Clovis High Plains Hospital, 1981).

Police Protection

Police protection is provided for most of Curry County by the county sheriff's office in Clovis. The county employs seven police officers, each equipped with a patrol car. The Clovis police department also has county jurisdiction, and can be called upon by the sheriff's office in emergencies. Clovis has 59 officers, 42 patrol cars, and three additional vehicles. A deputy sheriff with a vehicle is available in Texico, a night watchman is available in Melrose, and Grady relies upon the sheriff's office. In addition, state police frequently patrol the county (County sheriff's office and Clovis police department, 1981).

Fire Protection

Clovis has four engine companies, 50 paid firefighters, and four ambulances. Other equipment includes one 1,500-gallon pumper truck, one snorkel unit, and one rescue truck. The city has a fire insurance rating of six. Under a mutual aid agreement with Cannon AFB fire department, equipment and personnel can be shared. Grady, Melrose, and Texico are served by volunteer fire departments of 25, 12, and 17 personnel, respectively. The fire insurance rating is nine in Grady and Melrose, and eight in Texico (Clovis fire department, and Grady, Melrose, and Texico town clerks, 1981).

Traffic and Transportation (3.4.6.3.7)

The Clovis area is served by two U.S. highways and numerous state and county roads. The proposed site involves the expansion of an existing facility, Cannon AFB, which is located approximately 10 mi west of Clovis along U.S. 60, which provides the primary access to the base. State Route 467 extends south from near the base and provides access to Portales 13 mi from the base. Figure 3.4.6.3-1 shows the major roads in the area and 1978 traffic volumes.

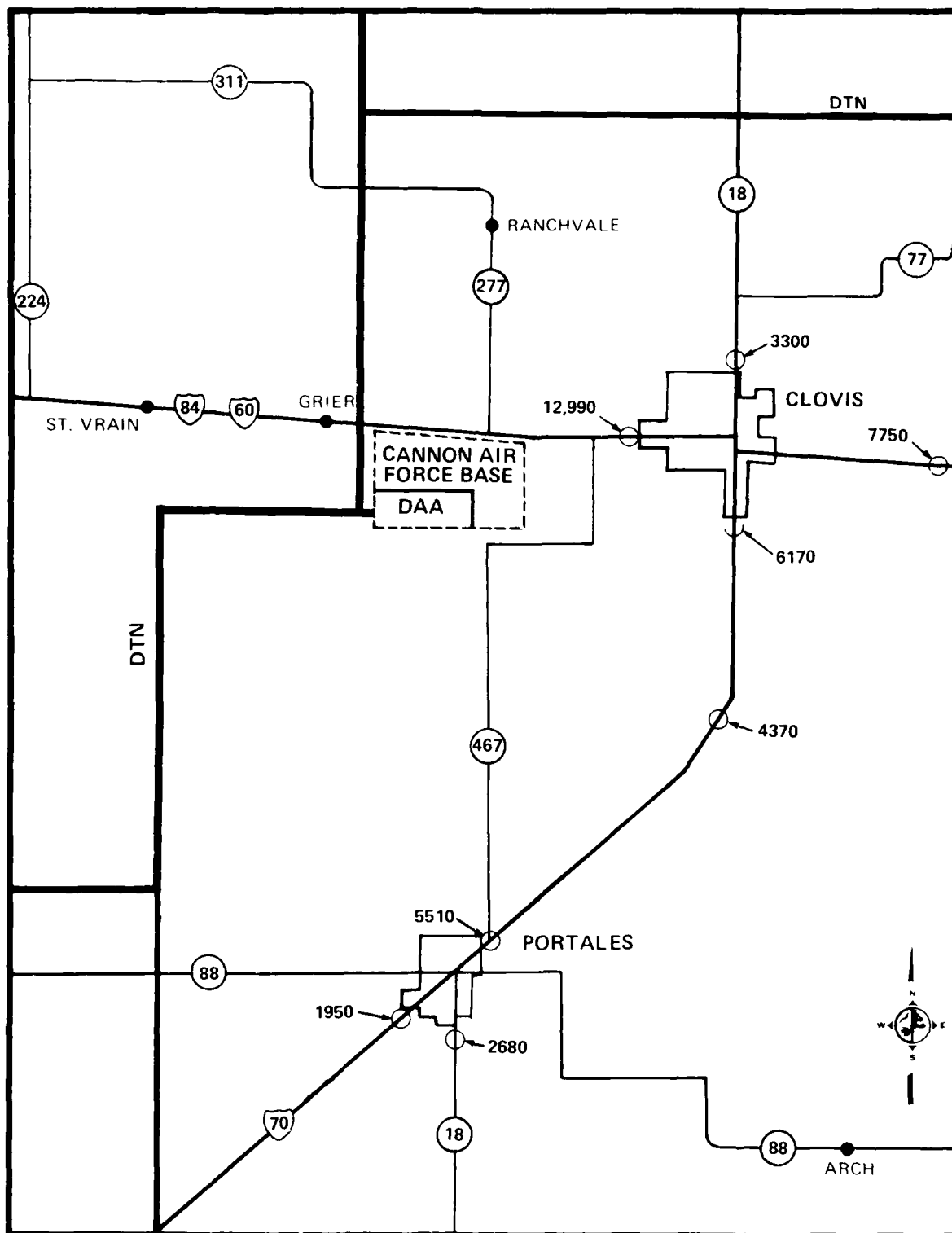
Clovis is served by the Atchison, Topeka and Santa Fe Railroad, and commercial airline service is available at the municipal airport.

Energy (3.4.6.3.8)

Natural gas supplies are excellent; petroleum product and crude oil pipelines cross the Clovis area and fuel supplies are excellent. Electrical energy is supplied to Clovis via two 115 kV transmission lines. Cannon AFB is supplied by a 69 kV line from Clovis.

Land Ownership (3.4.6.3.9)

The suitability zone for the proposed Clovis OB site is 78 percent privately owned, and the remainder is DOD land (Cannon AFB, 20 percent) and State Trust land, 3 percent. About 96 percent of the land in Curry County is privately owned. The zone is located about four mi west of Clovis, at the closest point.



LEGEND 000 - 1978 TRAFFIC VOLUMES; CLOVIS, NEW MEXICO

2181-A-2

SOURCE: NEW MEXICO STATE HIGHWAY DEPARTMENT

SCHEMATIC NOT TO SCALE

Figure 3.4.6.3-1. Existing traffic volumes in the vicinity of Clovis.

Land Use (3.4.6.3.10)Urban Land Use

With the location of an OB near Clovis, urban land use changes would primarily be felt in the counties of Curry and Roosevelt.

Curry County

Clovis, Curry County, and the surrounding jurisdictions are members of Eastern Plains Council of Governments (EPCOG), the regional planning agency and A-95 clearinghouse for a seven-county region in eastern New Mexico. As part of its local planning assistance program, EPCOG handles land use planning matters for Melrose, Texico, and Grady, all rural communities surrounded by agricultural lands in Curry County. Melrose, 24 mi west of Clovis, is the largest of these three rural communities with 425 acres of developed land (see Table 3.4.6.3.10-1). Texico, on the New Mexico/Texas border opposite Farwell, Texas, has 290 acres of developed land, while Grady in northern Curry County has 100 acres of development.

The City of Clovis is the county seat for Curry County and acts as the commercial center for eastern New Mexico and western Texas. Existing land use data by use category (e.g., residential, commercial, industrial) are not available for the City of Clovis. However, as of late 1980, 82 percent of the 8,320 acres in the city was used for urban purposes, while 1,460 acres were vacant (see Table 3.4.6.3.10-1). The community has experienced growth during the 1970s with annexations of 119 acres in 1974, 39 acres in 1975, and 73 acres in 1976. EPCOG has identified Clovis as one of four primary growth centers in the seven-county region. The City of Clovis general plan was adopted in 1969 and is currently being revised.

Cannon Air Force Base prepared a "TAB A-1 Environmental Narrative" in 1975, which contained suggestions for density and building restrictions for the areas impacted by noise and accident potentials around the base. Urban uses for housing, stores, and offices on the base totalled 870 acres in 1980.

Roosevelt County

Portales, lying 19 mi to the south of Clovis, is the Roosevelt County seat. Portales is about one-third the size of Clovis in land area. In 1969 residential use occupied approximately 620 acres, equivalent to one-quarter of the land area, while streets covered over 900 acres, almost one-half of the developed land area (see Table 3.4.6.3.10-2). Land use planning is guided by the city's comprehensive plan adopted in 1969.

Agriculture

Over a third of the 9,540 acre suitability zone for the potential Clovis OB is presently used for irrigated agriculture and an equal amount is used by Cannon AFB. The remaining area is dry farmland. The base is about five mi west of Clovis. (see Figure 3.3.3-4 of ETR-20 (Land Use)).

Table 3.4.6.3.10-1. Existing urban land use in Curry County, New Mexico.

Community	Vacant	Developed	Total
Clovis	1,460	6,860	8,320
Melrose	695	425	1,120
Grady	80	100	180
Texico	240	290	530
Total	2,475	7,675	10,150

T4107/9-2-81

Source: Personal contact with EPCOG, 30 October 1980.



Although productive, the agriculture in Curry County is suffering from high fuel rates, dropping groundwater levels, and cutbacks in federal farm subsidies. The area above is part of the 9,540-acre Clovis OB suitability zone.

Table 3.4.6.3.10-2. Existing land use -
Portales, New Mexico

Land Use	Portales	
	Acres	Percent
Residential	621.5	26
Commercial	89.1	4
Industrial	5.5	0
Public	309.4	13
Park	25.2	1
Streets/Railroad	958.4	40
Developed Land Subtotal	2,009.1	84
Agriculture	156.3	6
Vacant	237.9	10
Total	2,403.3	100

T5921/9-22-81

Source: Jose Luis Yguado and Associates, 1970,
"Comprehensive Plan - Portales, New
Mexico."

Recreation

Parklands

All but one of the developed parklands within close vicinity (approximately 50 mi) of Clovis are owned and managed by the New Mexico Parks and Recreation division. Included are Oasis, Conchas Lake, Los Esteros Lake, Sumner Lake, and Ute Lake State Park. Ned Houk Memorial Park is operated by the city of Clovis. The National Fish and Wildlife Service manages Grulla and Mulshoe Wildlife Refuges (Table 3.4.6.3.10-3). The major type of recreational opportunities supplied by these sites are camping and water activities (fishing, boating and swimming).

Water-Related Recreational Facilities

As noted above, a number of water based recreation facilities are available around Clovis. The two largest lake-sites, Sumner and Ute, total approximately 10,000 surface acres and both are approximately 70 mi from Clovis. Conchas and Los Esteros Lakes are 30-50 mi beyond the lakes mentioned above.

Snow-Related Recreational Facilities

There are no snow-related recreational opportunities in the vicinity of Clovis. The nearest facilities are in the Carson, Lincoln, and Santa Fe National Forests over 150 mi to the west.

ORV and Other Forms of Dispersed Recreation

There is one developed ORV park in this area at Ute Lake State Park. Most ORV activity is expected to be concentrated around urban centers or areas associated with hunting, fishing, or sightseeing along the river drainages. In Quay, Roosevelt, and Curry counties, there are only 2 mi of designated trails for ORV activity. There are no designated hiking trails, primitive camping sites, or stream fishing sites. The primary reason for this lack of dispersed recreation is that only a very small portion of these counties (0.62 percent of the total area) is devoted to recreation (New Mexico State Planning Office, 1976).

Recreation Within the Suitability Zone

There are no developed recreational sites within the proposed OB suitability zone. Dispersed recreation at undeveloped sites is expected to be very limited, if there is any at all, due to the predominance of private land (Figure 3.4.6.3.10-1).

Mining

No mining operations are located near the proposed OB site.

Native Americans (3.4.6.3.11)

Cultural Resources (3.4.6.3.11.1)

No significant cultural resources associated with the Apache and Comanche peoples have been documented for the Clovis region. There are no reservation lands or Native American communities close to the area.

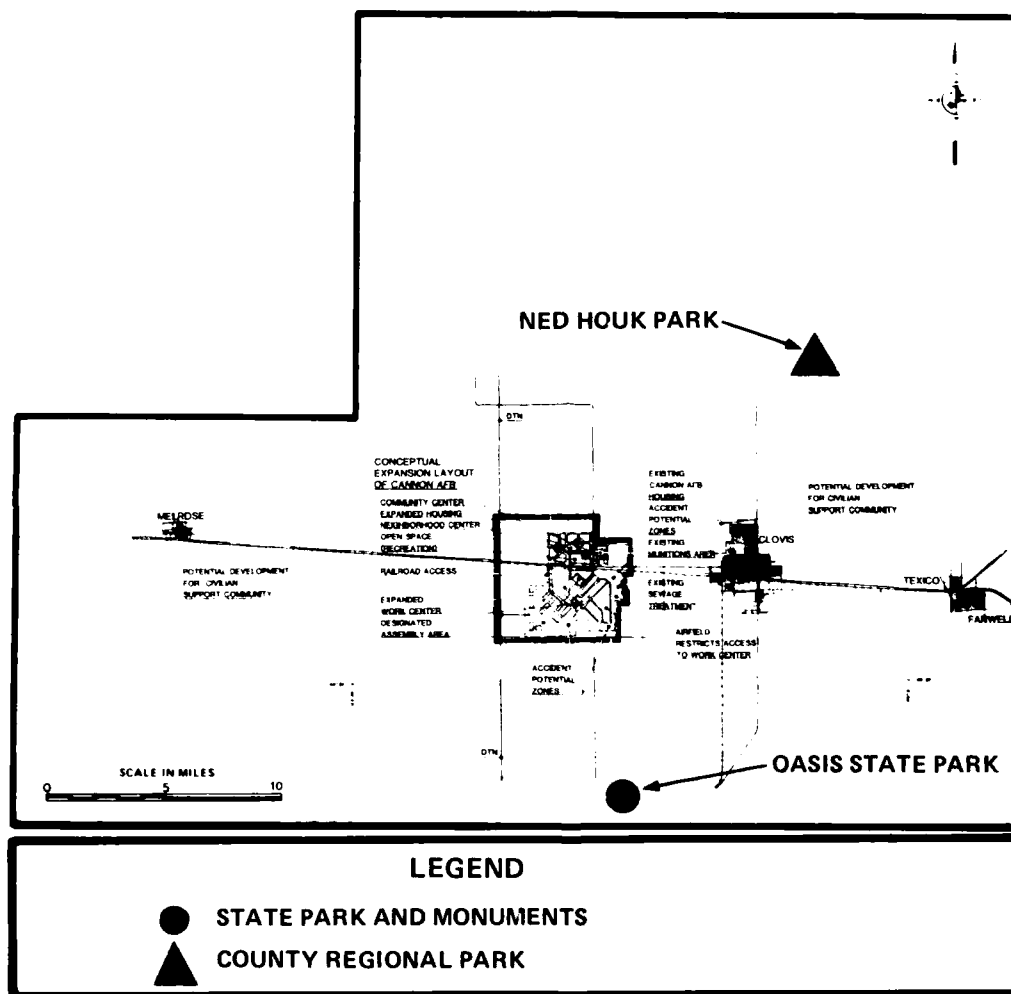
Table 3.4.6.3.10-3. Developed recreation sites in the vicinity of Clovis.

Site Name	Activities	Acres	<u>±</u> Miles From Clovis
Oasis State Park	Camping (34) ² Fishing Picnicking	200	20
Sumner Lake State Park	Camping (42) ² Fishing - L&S ³ Boating Swimming	220 6,000 ¹	70
Ute Lake State Park	Camping (151) Fishing Boating Swimming	1,307 4,078 ¹	70
Gruella Wildlife Refuge	Sightseeing (Bird Watching)	3,321	35
Muleshoe Wildlife Refuge	Picnicking	6,000	50
Ned Houk Park	Fishing Boating	3,400	7

T3810/9-20-81/F

¹Surface Water Area.

Source: New Mexico State Planning Office, 1976; Texas Parks and Wildlife Department, 1975.



4718-A-1

Figure 3.4.6.3.10-1. Recreation sites in the vicinity of Clovis, New Mexico.

Native American Land/Water Resources (3.4.6.3.11.2)

There are no known Native American land and water resources in the vicinity of the proposed Clovis OB site.

Socioeconomic Characteristics (3.4.6.3.11.3)

There are no reservation lands or Native American communities in the vicinity of the proposed OB site.

Archaeological and Historic Resources (3.4.6.3.12)

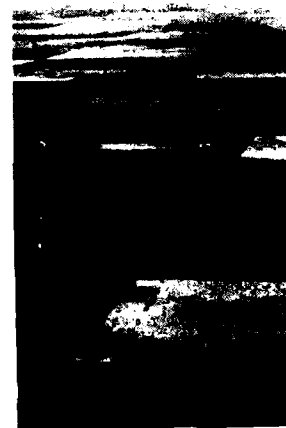
The Clovis vicinity zone is located on the Llano Estacado, a vast flatland dotted with small karst features, or playas. Recent surveys (EDAW 1981c, US COE 1981) have demonstrated that, while site density is quite low, sites dating to the Paleo-Indian and Archaic periods, the oldest and least understood periods in North American prehistory, are found near playas. Paleo-Indian sites are commonly found within playas where they have been buried by shifting soil.

In general, sites are expected within a mile of playas, especially on overlooking knolls. The nearby Blackwater Draw Archaeological District is on the National Register, and amply demonstrates that the general area contains numerous Paleo-Indian sites of the highest scientific significance.

Paleontology

The Clovis OB is located about 35 mi from the western escarpment of the High Plains. Fossil occurrences are not common and consist mostly of gastropods and seeds.

Dalhart



DALHART

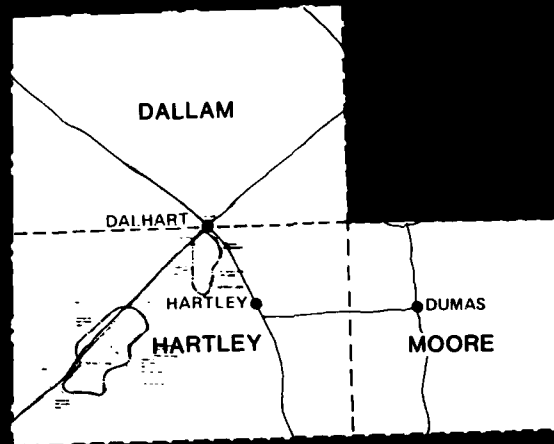
Introduction

The area of analysis (AOA) for the Dalhart operating base option includes Dallam and Hartley counties (Figure 3.4.7-1). Dalhart is the major settlement in the AOA. This section details important environmental characteristics of Dalhart and vicinity.

Quality of Life, Dallam County, Texas (3.4.7.1)

Table 3.4.7.1-1 gives selected quality of life indicators for the potential operating base counties in Texas, along with the appropriate state and national figures. Dallam County is sparsely populated with only 4.4 people per sq mi. Its population growth rate between 1970 and 1977 (1.7 percent), while faster than the nation as a whole (0.9 percent), was considerably lower than the state figure of 2.3 percent annually. Although its population was not keeping pace with the state's growth in the 1970s, Dallam County's civilian labor force grew at a fast rate; 5.3 percent versus 4.8 percent for Dallam County and Texas, respectively. The county's unemployment rate, at 4.5 percent, was lower than that for Texas as a whole (5.3 percent), but its 1977 per capita income at \$3,866 was only 57 percent of the Texas figure. There was also a relatively higher proportion of the population on public assistance in the county than in the state; 20.4 percent versus 18.6 percent, respectively. In the area of housing, the degree of overcrowding was less than in Texas as a whole; the median house value, \$7,358, was substantially below the state figure of \$12,359; and the owner-occupancy rate a little higher than that for the state. The county's standing on health services indicators varied. With 0.6 physicians, 5.4 nurses, and 6.9 hospital beds per 1,000 population, it ranked better than the state, but below the state on its dentist-to-population ratio of 0.3/1,000 population (Table 3.4.7.1-1).

In the area of public safety, the index of violent crimes and crimes against property were both substantially below the corresponding state and national figure. In terms of social stress, Dallam County's divorce rate of 6.9/1,000 population was higher than the state average; its suicide rate of 11.9/1,000 the same as the state's;



4430 C

Figure 3.4.7-1. Area of analysis (AOA), Dalhart.

Table 34.7.1-1. Selected measures of the quality of life, Texas (Page 1 of 3).

Indicator	United States	Texas	Dallam County (Dalhart)	Hartley County (Dalhart)
Population				
Annual Rate of Growth (1970-1977)	0.9	2.3	1.7	1.6
Population Density (1977)	61.1	47.0	4.4	2.0
Housing				
Percent of Dwelling Units Owner Occupied (1970)	62.9	64.7	65.6	69.2
Percent of Housing Units with More than 1.01 Persons/Room (1970)	8.0	11.1	8.6	11.5
Mobile Homes or Trailer as Percent of Housing Units (1970)	4.5	N/A	N/A	N/A
Median Home Value (1970)	17,130	12,359	7,358	16,919
Economics				
Civilian Labor Force Growth Rate (1970-1977)	2.4	4.8	5.3	13.9
Unemployment Rate (1977)	7.0	5.3	4.5	2.1
Per Capita Income (1977)	7,026	6,803	3,866	4,611
Proportion of Population on Public Assistance (1976)	22.2	18.6	20.4	7.4

T4845/9-16-81/F

Table 3.4.7.1-1. Selected measures of the quality of life, Texas (Page 2 of 3).

Indicator	United States	Texas	Dallam County (Dalhart)	Hartley County (Dalhart)
Health				
Physicians/1,000 Population (1976)	1.7	1.5	0.6	0.0
Dentists/1,000 Population (1976)	0.5	0.4	.3	.3
Registered Nurses/1,000 Population (1976)	4.5	2.4	5.4	5.4
Hospital Beds/1,000 Population (1975)	6.6	6.2	6.9	0.0
Public Safety				
Police Officers/1,000 Population (1976)	2.8	2.2	N/A	N/A
Firefighters/1,000 Population (1968)	2.0	N/A	N/A	N/A
Violent Crimes/1,000 Population (1976)	4.0	5.4	1.4	1.4
Crimes Against Property/1,000 Population (1976)	45.9	24.2	14.6	14.8
Social Stress				
Divorce Rates/1,000 Population (1975)	4.9	6.3	6.9	4.7
Suicide Rate/100,000 Population (1976)	12.2	11.9	11.9	11.9
Alcoholism Rate/1,000 Population (1976)	42.0	28.3	19.2	19.2

T4845/9-16-81/F

Table 3.4.7.1-1. Selected measures of the quality of life, Texas (Page 3 of 3).

Education	Indicator	United States	Texas	Dallam County (Dalhart)	Hartley County (Dalhart)
Median School Years Completed (1976)		12.5	12.4	11.3	12.4
Pupil/Teacher Ratio		19.5:1	N/A	15.7	15.7

T4845/9-16-81/F

Sources: Architects and Planners Alliance, Inc., 1979; Bureau of Economic and Business Research, 1979; De Chiasa, J. and L. Koppelman, 1975; Four Corners Regional Commission, 1979; Golden, J. et al., 1979; Nevada Department of Education, 1979; Nevada Office of Health Planning and Resources, 1977; Nevada Office of Planning Coordination, 1978; U.S. Department of Commerce, 1978 and 1979; U.S. Department of Commerce, Bureau of the Census, 1973 and 1978; U.S. Department of Justice, 1977.

but its alcoholism rate of 19.2/1,000 was lower than that for Texas as a whole. Dallam County's residents had a median of 11.3 school years completed, compared is 12.4 for the state, and its pupil to teacher ratio was 15.7:1 (Table 3.4.7.1-1).

Natural Environment (3.4.7.2)

The following sections describe existing characteristics of the natural environment of the Dalhart Operating Base Vicinity. Topics covered include Water Resources, Erosion, Air Quality, and Biological Resources.

Water Resources (3.4.7.2.1)

The principal aquifer is sand and gravel beds interbedded with silt, sand, and caliche and ranges in saturated thickness from 200 to 500 ft. Precipitation is the sole contributor to groundwater recharge. Withdrawals are 15 times the annual natural recharge. Heavy pumping has resulted in large water-level declines. The groundwater is acceptable for most uses.

The Mustang and Carrizo creeks flow southeastward joining north of Dalhart to form Rita Blanca Creek. The Rita Blanca has been dammed just south of Dalhart to form Lake Rita Blanca which is used for recreation.

Precipitation usually occurs most often as infrequent but intense thunderstorms producing rapid surface runoff. About 80 percent of the annual rainfall occurs from May through October. Consumptive use of surface water is limited.

Erosion (3.4.7.2.2)

The major soils within the proposed Dalhart OB site have formed on gently rolling or nearly level uplands. These soils have medium or sandy textures. These soils are moderately to highly susceptible to wind and water erosion.

Air Quality (3.4.7.2.3)

A summary of some climatological conditions influencing air quality appears in Table 3.4.1.2-1. The Dalhart OB site is located in AQCR No. 211. Particulate and gaseous emissions for this AQCR are given in Table 3.4.1.2-2. Visibility is poor, due to strong winds and the resulting fugitive dust emissions.

Biological Resources (3.4.7.2.4)

Area soils are formed on nearly level to gently sloping and undulating upland plains. Slopes are 0 to 3 percent except on the more undulating and hummocky areas where slopes range from 3 to 8 percent. Soils are deep, noncalcareous to calcareous, with surface textures ranging from fine sandy loams to loamy fine sands and fine sands. Runoff is slow to medium. The predominant soil series present are Dallam and Vingo.

The area is presently under agricultural and range use, with native vegetation on rangelands, although it is disturbed. The wildlife species in the area are those common to the agricultural and range areas of the western Texas Panhandle. There is no aquatic habitat at the site. The only protected species likely to be present are the Central Plains milk snake, the Texas horned lizard, and migrating individuals of bald eagle, American peregrine falcon, and whooping crane. No protected plants are reported in the area.

There are no nearby wilderness resources. The nearest wilderness resource is the Sabinosa Wilderness Study Area approximately 100 air-miles from the proposed Dalhart OB. The nearest significant natural area is Rita Blanca National Grasslands which includes most of Buffalo Springs, a potential National Natural Landmark (Table 3.4.7.2.4-1). The site is close to the Canadian River Valley, an extensive, topographically complex, biologically diverse area which harbors populations of protected plants and animals, both aquatic and terrestrial.

The M-X-induced urban growth in the Dalhart area would occupy farmland and the adjacent valley of an intermittent stream tributary to the Canadian River, which is continuous with the Canadian Breaks. The Dalhart Valley is open rangeland, with habitat for shortgrass prairie plants, upland game, and larger mammals such as mule deer and pronghorn, both of which are found in the Canadian Breaks. The Canadian Breaks proper, with open rangeland and shortgrass prairie areas of upland juniper breaks and riparian vegetation, is located 15 mi south of the base, and is the largest undisturbed natural area in the Texas Panhandle. There are also a small number of playa lakes.

Human Environment (3.4.7.3)

The following sections describe baseline socioeconomic and cultural characteristics of the Dalhart Operation Base Vicinity Environment. Included are: Employment, Income and Earnings, Public Finance, Population, Housing, Community Infrastructure, Traffic and Transportation, Energy, Land Ownership, Land Use, Native Americans, and Archaeological/Historical Resources.

Employment and Labor Force (3.4.7.3.1)

The site for the Dalhart OB option is in the northern section of the Texas/New Mexico region of influence (ROI). The OB would be located 15 miles southwest of the town of Dalhart. The area of analysis (AOA) for this OB siting option includes Dallam, Hartley, and Moore counties. A detailed analysis of the employment and labor force in the AOA is shown in Section 2.1.3.7 of ETR-44. The Dalhart OB would be built only under Alternative 7 (full 200 Texas/New Mexico deployment), in which case it would be the second OB. Other OB site options are Clovis, New Mexico; Coyote Spring and Ely, Nevada; and Beryl, Delta, and Milford, Utah.

Recent Labor Force Trends

Dallam County

The labor force in Dallam County dropped significantly in 1976 and 1977 but rebounded in the following years. In 1976, the county labor force decreased by 600

Table 3.4.7.2.4-1. Significant natural areas within a 50 air-mile (80 km) radius of the potential Dalhart OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	Km
Texas		
Rita Blanca National Grasslands	30	50
Buffalo Springs	40	65
New Mexico		
Bueyeros Shortgrass Plains	35	55
Kiowa National Grasslands	40	65

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Dalhart has preserved its brick streets and an economically viable downtown area.

persons from the previous year. After this sharp decline, the labor force in Dallam County rebounded to its 1974-75 level of 2,500 workers. The county employment level mirrored the labor force decline in 1976 and 1977, dropping to 1,860 and 1,910 workers, respectively. In 1980, 2,270 county residents were employed.

The number of unemployed has ranged between 60 persons in 1974 and 110 in 1980. In 1977, the unemployment rate reached 4.5 percent, its highest level in the 1974-80 period. The annual average unemployment rate was 3.5 percent over the period.

Hartley County

The size of the labor force in Hartley County showed a significant drop in 1976 and 1977. The number of workers in the county dropped below 1,000 in 1976 and 1977 and then increased in the following three years to more than 1,200 persons. The number of employed persons dropped below 1,000 during those years. In 1980, 1,190 persons living within the county were employed.

The number of unemployed workers has remained relatively stable over the 7-year period, ranging between 20 persons in 1977 and 35 in 1974. Since 1976, the unemployment rate has been below at 3.0 percent.

Moore County

The labor force in Moore County has increased over the past 7 years, from 6,210 workers in 1974 to 7,300 in 1980. Slight decreases in the number of available workers occurred in 1975 and 1979. The county labor force and employment levels both peaked in 1978 at 7,480 and 7,160 persons, respectively. In 1980, 6,990 persons living in Moore County were employed.

The number of unemployed in the county peaked at 30 in 1975, the only year the unemployment rate rose above 5.0 percent during the 7-year study period. In 1980, 310 county residents, or 4.2 percent of the labor force, were unemployed.

Projected Employment

Employment projections for Dallam, Hartley, and Moore counties are presented in Section 3.3.3.1.2. Sectoral employment projections analogous to those presented in previous sections are not available for Dallam, Hartley, and Moore counties.

Income and Earnings (3.4.7.3.2)

The counties potentially most affected by location of an operating base in the Dalhart area are Hartley, Dallam, and Moore Counties. Detailed baseline earnings data can be found in ETR-3B.

Hartley County

Total earnings in Hartley County stood at \$2.3 million in 1979. Agricultural activities, principally in the form of livestock and grazing activities, dominate the local economy. Earnings (wage and salary disbursements) per worker stood at \$7,895

in 1979. Although this is significantly lower than the state average (\$12,771), they have not exhibited the yearly fluctuations evident in the income per capita rates over the 1969-79 period. On the average, income per capita levels in the county over the 1969-79 period was \$4,409 compared to the state and U.S. averages of \$5,393 and \$5,681, respectively. However, substantial yearly variation occurs due to fluctuating farm proprietors income levels.

Dallam County

Total earnings in Dallam County amounted to \$36.5 million in 1979. Agricultural activity (principally from livestock and grazing activities) dominates the local economy. Earnings (wage and salary disbursements) per worker stood at \$9,751 in 1979, significantly lower than the state average of \$12,771.

Per capita income fluctuated moderately around the \$3,800 level over the years 1969-74. Per capita income in the 1974-79 period, while still exhibiting some cyclic behavior, was, in general, on the rise. On the average, however, per capita income over the 1969-79 period was below both state and U.S. averages--\$5,215 compared to \$5,393 for the state and \$5,681 for the United States.

Moore County

Total earnings in Moore County amounted to \$8.3 million in 1979. Agricultural activities play an important role in the county's economy, although a relatively strong manufacturing base accounted for over one-third of total county earnings in 1979. Because of this base, earnings (wage and salary disbursements) per worker in the county are comparable to statewide levels --\$12,593 compared to \$12,771 statewide in 1979. Per capita income generally is slightly below state levels, although strong gains in farm income in 1977 brought per capita income up to \$7,698 in this year.

Public Finance (3.4.7.3.3)

Dalhart

Revenue structures, expenditure patterns, and fiscal capacities of the counties of Dallam and Hartley, and the city of Dalhart provide a measure of these government's abilities to absorb growth. Data are provided only for the largest municipalities in the area. Budgets for the counties, city of Dalhart, and respective school districts are presented in ETR-3B.

Property taxes are the largest source of local revenue in Hartley County at 69.7 percent of total revenues as Table 3.4.7.3.3-1 indicates. In Dallam County, only 34.9 percent of revenues are received from property taxes (Table 3.4.7.3.3-1). Dallam County also collects much of its revenues from motor vehicle registration, and fines, fees and charges. In the fiscal year 1979-80, these sources accounted for 43 percent of total revenues. Table revenues have remained constant in Dallam County over the FY 1977-1978 to FY 1979-1980 period.

In Hartley County, the largest expenditures were for administration at 50.9 percent, while expenditures on public safety were 8.9 percent in fiscal year 1979-80. Capital improvements and machinery, primarily for roads, accounted for another

Table 3.4.7.3.3-1. Recent average annual growth rates and percentage shares of specific revenue and expenditure categories, Dallam, Hartley, and Moore counties and selected communities.

	TOTAL REVENUE		PROPERTY TAX REVENUES		INTERGOVERNMENTAL TRANSFERS		TOTAL EXPENDITURES		PUBLIC SAFETY EXPENDITURES	
	ANNUAL RATE		ANNUAL RATE	% OF TOTAL REVENUES	ANNUAL RATE	% OF TOTAL REVENUES	ANNUAL RATE		ANNUAL RATE	% OF TOTAL EXPENDITURES
Dallam County	0%		-0.7%	34.9%	-0.4%	20.4%	6.0%		11.0%	14.6%
Hartley County	N/A		N/A	69.7%	N/A	6.4%	N/A		N/A	8.9%
Moore County	27.0%		29.3%	32.0%	-7.1%	6.6%	41.7%		109.1%	10.0%
Dalhart (Dallam, Hartley counties)	5.2%		23.1%	17.5%	N/A	N/A	4.3%		7.6%	19.5%
Dumas (Moore County)	21.5%		-19.5%	16.7%	N/A	N/A	17.8%		41.6%	38.9%

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Expenditures on sheriff, tax collector, charity and public services.

Sheriff expenditures.

Police and fire expenditures.

For general fund revenues and expenditures only.

Source: HDR Sciences.

Revenue and expenditure data were obtained for the years FY 1977-78 to FY 1979-80 for Dallam and Moore counties, but only for FY 1979-1980 for Hartley County.

Growth rates were calculated over this period, while percent share figures were estimated for the most recent fiscal year.

Additional data are presented in EIR-3B.

26.4 percent. The largest single area of expenditures in Dallam County was for administration at 27 percent. Social services (transportation, health/welfare, and public safety) accounted for another 56.9 percent. Expenditures as a whole have increased, on averages, by 6 percent annually over the FY 1977-1978 - FY 1979-1980 period.

Dalhart relies heavily on local sources of revenue. Property taxes, sales, tax, and charges for services account for 80.6 percent of total revenues in the 1979-80 fiscal year. Expenditures in Dalhart are primarily in social services. Public safety (police and fire), streets (transportation), and sanitation combined to account for 71.6 percent of total expenditures. Other major expenditures are for the Water/Sewer Fund and the Water/Sewer Sinking Fund. Table 3.4.7.3.3-1 indicates slightly more growth in revenue sources as compared to expenditures.

Revenues and expenditures for Moore County and the City of Dumas are also presented in detail in ETR-3B and summarized in Table 3.4.7.3.3-1. Property taxes constitute 32.0 percent of total revenues in Moore County. Service charges contribute another 16.5 percent. The table indicates very rapid growth in revenues, 27.0 percent per year over the FY 1977-1978 to FY 1979-1980 period. Dumas relies primarily on sources other than property taxes. Sales tax, fees, and fines contribute 66.4 percent of revenues and property taxes only 16.7 percent. Administration was the largest area of expenditure in Moore County at 48.2 percent. Other major expenditures are in the Road and Bridge Fund and the Revenue Sharing Fund. Combined, these expenditures have grown by an average 41.7 percent per annum over FY 1977-1978 - FY 1979-1980 period in Moore County. In Dumas, expenditures are concentrated mostly in public safety, transportation, and sanitation. These services accounted for 70.8 percent of expenditures in 1979-80.

Table 3.4.7.3.3-2 presents summary revenue and expenditure information for Hartley, Dallam, and Moore County school districts. In all school districts, instruction accounted for the largest expenditures. Operation and maintenance of the physical plant comprised another major portion. Revenue for the school districts is obtained principally from state and local contributions. Hartley and Moore County school districts derive most of their revenue from local sources, while Dallam depends more heavily on state contributions. Table 3.4.7.3.3-2 also compares growth rates of key fiscal variables in the six school districts in the three counties.

Table 3.4.7.3.3-3 presents assessed value, indebtedness, and reserve bonding capacity of the local governments and school districts in Hartley, Dallam, and Moore counties. Individual jurisdictions are responsible for determining assessment level to fair cash value. Levels range from a low of 16 percent of cash value in Moore County, to 100 percent of cash value in the school districts for 1980. Beginning in 1982, Senate Bill 621 of the Texas Property Tax Code, will equalize all assessments in the state at 100 percent of fair cash value in 254 designated appraisal districts. Tax rates will be decreased both before and after the changeover to equalize property tax payments. Year-to-year rollback allowances and tax rate limitations prohibit substantial tax rates increases to finance operation and debt service costs. As a result, local jurisdictions in Hartley, Dallam, and Moore counties are able to support continued growth at current rates. However, these counties would experience severe difficulties in accommodating rapid, large-scale growth.

Table 3.4.7.3.3-2. Growth rates and percent of total revenue and expenditures for specific revenue sources and expenditure categories, Dalhart area school districts, 1978-79 to FY 1980-81.

School District	County	Local Revenues			State Revenues			Instructional Expense			Maintenance/Operation of Plant		
		Total Revenues Growth Rate	Growth Rate	Percent of Total Revenues	Growth Rate	Percent of Total Revenues	Total Expenditures Growth Rate	Growth Rate	Percent of Total Expenditures	Growth Rate	Percent of Total Expenditures		
Hartley	Hartley	13.8	8.3	65.4	25.0	34.3	11.4	12.6	54.4	9.9	13.9		
Channing	Hartley	22.8	19.9	76.8	34.5	23.2	16.6	14.3	64.3	10.1	12.7		
Dalhart	Dallam	18.6	20.1	43.2	17.4	56.7	18.5	16.5	68.6	18.0	8.1		
Texline	Dallam	9.5	-5.3	54.7	31.3	44.2	9.7	9.6	55.6	18.5	11.5		
Dumas ¹	Moore	14.5	14.7	62.9	11.6	36.6	15.6 ²	14.0	71.3	9.9	11.7		
Sunray ¹	Moore	9.7	7.6	76.4	16.8	23.5	13.0	6.6	58.2	71.2	15.7		
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¹ FY 1979-80 and FY 1980-81 only.

² Total expenditures do not include 1,412,000 in capital outlay for FY 1980-81.

Source: See ETR-3B.

Table 3.4.7.3.3- 3. Assessed value, bonded indebtedness, reserve bonding capacity, and tax rates for taxing jurisdictions in Dalhart OB AREA, 1980.

Jurisdiction	Assessed Value	G.O Indebtedness	Reserve Bonding	Debt Tax Rate ⁹	General Fund Tax Rate
Hartley County	58,190,089 ¹	30,000	-- ⁶	0.02	0.78
City of Dalhart	74,856,240 ²	570,000	-- ⁸	0.01	0.39
Hartley ISD	39,598,135 ²	472,000	3,487,800 ⁷	0.12	0.86
Channing ISD	36,000,000 ²	0	3,600,000 ⁷	0	1.39
Dallam County	31,993,081 ³	0	-- ⁶	0	0.80
City of Dalhart	74,856,240 ¹	570,000	-- ⁸	0.01	0.39
Dalhart ISD	162,330,890 ²	745,000	15,485,000 ⁷	0.07	0.72
Texline ISD	47,000,000 ²	234,000	4,466,000 ⁷	0.09	0.51
Moore County	144,000,772 ⁴	535,000	-- ⁶	0.12	0.68
City of Dumas	52,179,800 ⁵	1,882,614	-- ⁸	0.45	0.35
Dumas ISD	386,820,940 ²	2,975,000	35,707,000 ⁷	0.106	1.034
Sunray ISD	93,643,542 ²	90,000	9,274,400 ⁷	0	1.17

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¹ 35% of actual fair market value.

² 100% of actual fair market value.

³ 30% of actual fair market value.

⁴ 16% of actual fair market value.

⁵ 60% of actual fair market value.

⁶ Tax bonds are limited to an amount which produces debt service requirements equal to or less than which can be paid by a tax rate of the 80 cent maximum tax rate.

⁷ Maximum debt service tax of \$1.00 per 100 assessed value and \$1.50 for general tax purposes.

⁸ Home rule charter with 1.5¢ per 100 assessed value maximum tax rate.

⁹ Per 100 assessed valuation.

Population and Communities (3.4.7.3.4)

The area of analysis (AOA) for the proposed operating base near Dalhart includes Hartley, Dallam, Moore, Potter, and Randall counties. The operating base would be located about 20 mi southwest of the town in a rural area of Hartley County. Potter and Randall counties contain the Amarillo urban area. The extent of the AOA is determined by the maximum daily commuting zone for direct project workers who would work at the OB. All five counties experienced growth during the last decade, with increases varying from 43.3 percent in Hartley County to a low of 8.6 percent in Dallam, as shown in Table 3.4.7.3.4-1.

Hartley and Dallam Counties

The city of Dalhart, with 6,854 residents in 1980, lies partially in each of these counties. The city's population increased by about 20 percent since 1970, with the largest share of the growth occurring in the Hartley County portion of the city. Other incorporated places in the two-county area include Channing in Hartley and Texline in Dallam County. During the last decade, Hartley County's population expanded at a considerably faster rate, about 3.7 percent annually, than did Dallam, where the annual growth rate was 0.8 percent. Hartley's population expanded by 1,205 persons to 3,987 in 1980, while Dallam grew by 519 to reach a population of 6,531 in 1980. Population densities remain low, with an average of 2.7 persons per sq mi in Hartley and 4.4 in Dallam in 1980. Dallam County has considerably larger concentrations of ethnic and racial minority groups, with persons of Spanish origin and blacks comprising 16.7 and 2.5 percent of the residents, respectively. The comparable proportions are 4.4 percent and 0.5 percent in Hartley County.

Moore County

The principal community in Moore County, located immediately east of Hartley, is Dumas, which had 12,194 residents in 1980. About three-fourths of the county's 16,575 residents were within the city of Dumas. The county had an average density of 18.2 persons per sq mi in 1980.

Potter and Randall Counties

These two counties, which had populations of 98,637 and 75,062, respectively, contain the Amarillo urban area. The city of Amarillo, with 149,230 residents in 1980, lies partially in each county. Randall was the more rapidly growing of the two counties with an annual rate of increase of 3.4 percent compared to 0.9 percent in Potter. Randall County added over 21,000 residents during the last decade compared with 8,000 in Potter. The relatively high densities of the two counties, 109.8 persons per sq mi in Potter and 82.1 in Randall, reflect the population concentration in the Amarillo urbanized area.

Housing (3.4.7.3.5)

Dallam County registered an increase of 483 units in its housing stock between 1970 and 1980, which translates into an average annual rate of change of 1.9 percent. The community of Dalhart (that part in Dallam County) contained 1,973 dwelling units, which constitutes 70 percent of the county total in 1980 and saw a 1.7 percent average annual rate of change between 1970 and 1980 (U.S. Department of Commerce, Bureau of the Census, 1981).

Table 3.4.7.3.4-1. Population and population change 1970-1980 by county and community within the Dalhart OB area of analysis.

County/Community	Population		Change 1970-1980		
	1980	1970	Number	Percent	Annual Rate ¹
Dallam County, Texas	6,531	6,012	519	8.6	0.8
Dalhart ccd ²	5,936	5,351	585	10.9	1.0
Dalhart city (pt)	4,571	4,340	231	5.3	0.5
Texline ccd	595	661	-66	-10.0	-1.0
Texline town	477	387	90	23.3	2.1
Hartley County, Texas	3,987	2,782	1,205	43.3	3.7
Channing ccd	866	975	-9	-1.0	-0.1
Channing city	304	336	-32	-9.5	-1.0
Northwest Hartley ccd	3,121	1,907	1,214	63.7	5.0
Dalhart city (pt)	2,283	1,365	918	67.3	5.3
Moore County, Texas	16,575	14,060	2,515	17.9	1.7
Dumas ccd	14,389	11,873	2,516	21.2	1.9
Dumas city	12,194	9,771	2,423	24.8	2.2
Potter County, Texas	98,637	90,511	8,126	9.0	0.9
Amarillo ccd	96,211	-	-	-	-
Amarillo city (pt)	93,019	86,477	6,542	7.6	0.7
Canadian River ccd	2,426	-	-	-	-
Randall County, Texas	75,062	53,885	21,177	39.3	3.4
Amarillo ccd	57,119	-	-	-	-
Amarillo city (pt)	56,211	40,533	15,678	38.7	3.3
Canyon ccd	12,785	-	-	-	-
North Randall ccd	5,158	-	-	-	-

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¹ Annual compound rate of change.

² Census county division.

Source: U.S. Bureau of the Census, Texas Final Population and Housing Unit Counts, (PHC80-V-45), March 1981.

During the period 1970-1979, an annual average of 44 dwelling units were authorized for construction in Dallam County. The annual addition to the housing stock varied from a low of 20 units in 1970 to a high of 58 units in both 1972 and 1979. The vast majority of these units are single family residences: annual average of 92 percent over the ten-year period (U.S. Department of Commerce, Bureau of the Census, 1970 to 1979, inclusive).

Hartley County experienced an average annual rate of growth of 4.4 percent in the number of housing units over the decade 1970-1980 when the number of units increased from 1,003 to 1,539. Of the increase of 536 units, 387 were located in Dalhart (Hartley County portion), 72 percent of the county increase. In 1980, 56 percent of the county housing stock was located in Dalhart, up from 47 percent in 1970 (U.S. Department of Commerce, Bureau of the Census, 1981).

Dallam County is projected to experience an average annual rate of growth of its housing stock of 1.3 percent over the period 1982-1994 under trend-growth conditions. This equates to an increase of 420 units from a base in 1982 of 2,625 units (refer to Table 3.3.3.4.2-1). This rate of change compares with 1.0 for the deployment region.

Hartley County is projected to experience an average annual rate of growth of its housing stock of 2.0 percent over the period 1982-1994 under trend-growth conditions. This equates to an increase of 352 units from a base in 1982 of 1,335 units (refer to Table 3.3.3.4.2-1). This rate of change compares with 1.0 for the deployment region.

Community Infrastructure (3.4.7.3.6)

Education

In 1980-81, there were 1,646 pupils enrolled in the 3 schools of Dalhart Independent School District. The district employed a total of 100 teachers. The Dalhart schools have no excess capacity, and portable classrooms will be needed to meet normal growth demand in 1981-82. Dallam County contains one other school in Texline, which had a 1980-81 enrollment of 218 for grades K-12. It has some excess capacity (Dalhart and Texline School Districts, 1981).

The 2 schools in Hartley County had a combined 1980-81 enrollment of 335. Teachers numbered 43. Enrollments have been steady over the last few years and each school, both K-12, can accommodate approximately 65 more students (Channing and Hartley School Districts, 1981).

Health Care

Dalhart has a hospital with 67 acute-care beds and 80 long-term-care beds, as well as 3 clinics. Health services in Dallam and Hartley counties are provided by 5 doctors, 20 LPNs, 10 RNs, 4 dentists, 3 part-time mental health workers, and approximately 43 support personnel. Plans to double the number of hospital beds and physicians are in progress (Dalhart Hospital, 1980).

Police Protection

County-wide police protection is provided in Dalham County by 14 sheriffs and four state troopers. Dalhart has seven policemen. Hartley County is served by only two sheriffs. These law enforcement officers have a limited amount of equipment and one jail, which is located in Dalhart (Panhandle Regional Planning Commission, 1980).

Fire Protection

Dalhart has 30 volunteers and one paid professional firefighter. Equipment includes: two 1,500 gallon pumpers, one back-up pumper truck, five 4-wheel drive vehicles, and a 250 gpm mini-pumper. Dalhart has a good key rating (24 cents) for a town of its size with a volunteer fire department. (The key rating reflects the fire insurance premium paid by the state for each designated area). Thus, a lower number (low insurance premium) indicates that a fire department provides better quality fire protection.) As there is no county fire department, Dalhart provides protection to outlying communities. The department also has a mutual aid agreement with Hartley County to provide manpower when necessary. The community of Channing in Hartley County has a fire department of 15 volunteers and five pieces of equipment. They also provide service outside the city limits. The fire insurance rating is .95 cents (Texas Industrial Commission, 1980).

Traffic and Transportation (3.4.7.3.7)

The proposed site is approximately 15 mi southwest of Dalhart on U.S. Highway 54. Dalhart is also served by U.S. Highway 385 which runs north and south through the area. Figure 3.4.7.3-1 shows the major roads in the Dalhart vicinity and the 1975 traffic volumes.

U.S. 54 has an average daily traffic of 1,830 vehicles near the proposed site, and U.S. 385 has average daily traffic of 4,300 vehicles south of Dalhart. A low volume county road, running west from Hartley passes near the site. Most roads are good quality two-lane facilities that provide good service for current traffic levels.

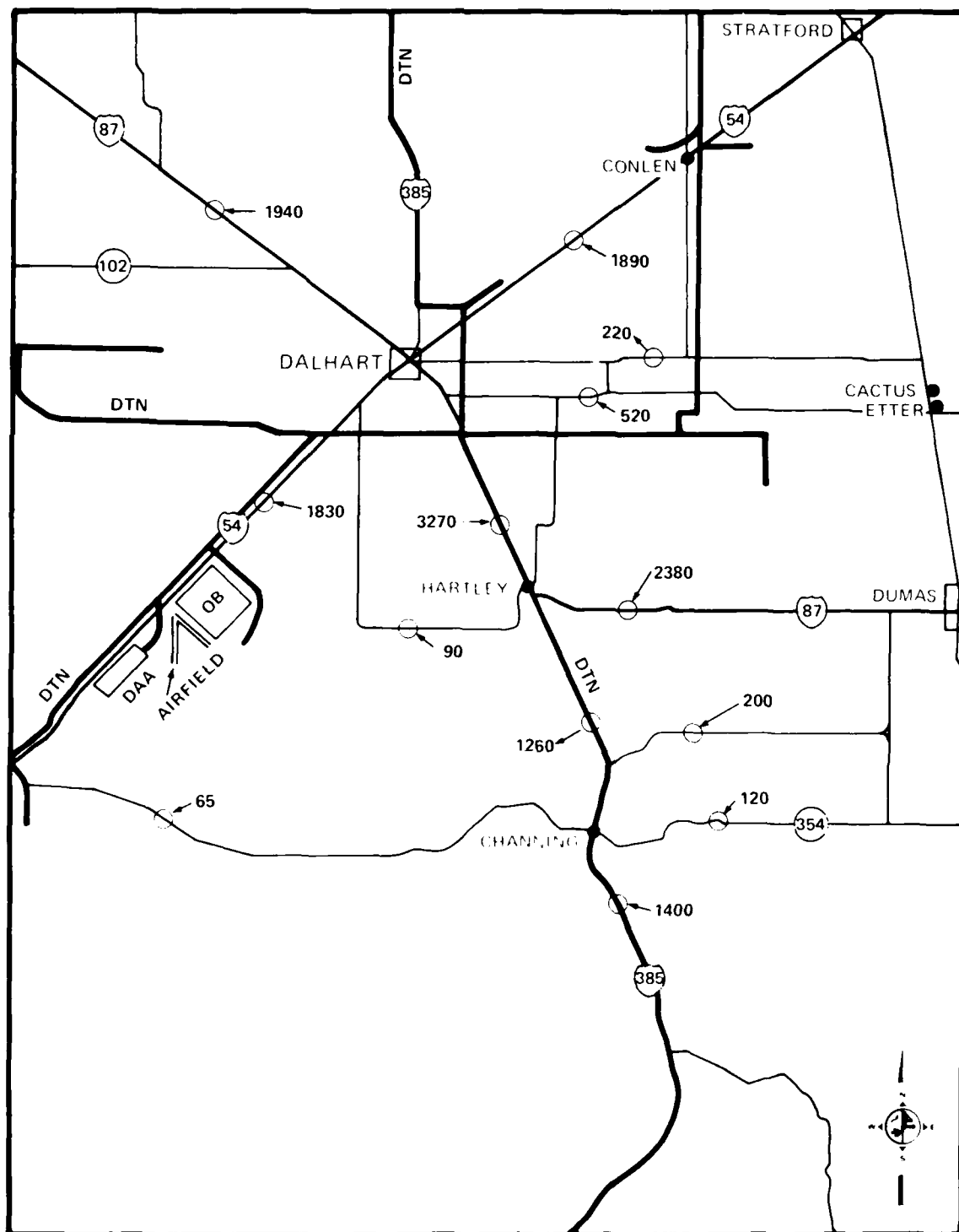
Three railroads provide service to the Dalhart area; the nearest commercial airline service is at Amarillo.

Energy (3.4.7.3.8)

Natural gas supplies are excellent and could handle increased demands. Amarillo is a large petroleum refining center and petroleum product supplies should be adequate for increased uses. Electrical energy is supplied to Dalhart by 115 kV and 69 kV transmission lines.

Land Ownership (3.4.7.3.9)

The suitability zone for the proposed OB complex at Dalhart is divided into two parts in Hartley County; the northern portion adjoins the city of Dalhart; the southern part lies about 17 mi to the southwest. The entire zone is privately owned.



LEGEND 000 1975 TRAFFIC VOLUMES DALHART TEXAS

SCHEMATIC NOT TO SCALE 2180-A-1

SOURCE TEXAS STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

Figure 3.4.7.3-1. Existing traffic volumes in the vicinity of Dalhart.

Land Use (3.4.7.3.10)Urban Land Use

With the location of an OB near Dalhart, primary urban land use impacts would be felt in Dallam and Hartley counties. Existing land use and planning activities for these counties is discussed below.

Dallam and Hartley Counties

The information available for existing land uses in Dallam and Hartley counties is primarily oriented toward regional land uses rather than detailed urban land uses. Table 3.4.7.3.10-1 provides 1970 data on land uses in Dallam and Hartley counties. The areas for urban land use are 7,900 and approximately 24,700 acres, respectively. However, these figures include land for railroads and highways, plus the Dalhart airport in Hartley County. As a result, the "urban land" data do not reflect the amount of land used solely for community land uses, such as for housing, commerce, and industry.

In January, 1978, the 25-county PRPC adopted a "Regional Land Resource Management Plan". This plan identified trends in socioeconomic development and established goals and policies aimed at giving guidance and direction to growth in the 25-county area. Furthermore, city and county governments were encouraged to develop implementing ordinances adequate to carry out the planning goals and policies that relate to their particular area. (An analysis of the goals and policies in the above plan plus those available from the member jurisdictions can be found in ETR-36, "Urban Growth and Planning."

The City of Dalhart's Comprehensive Plan, adopted in 1965, identified existing urban land uses at the time and recommended a land use pattern for future growth. The 1965 land area of the city was almost 1,500 acres, with about two-thirds of the land developed according to the following categories: residential, about 30 percent; commercial, 6 percent; industrial, 12 percent; public and quasi-public, 6 percent; and streets, 46 percent (see Table 3.4.7.3.10-2). The existing land use patterns in 1965 showed the developed areas to be concentrated near the center of town with some development extending to the south and east.

The town of Texline, 36 mi to the northwest of Dalhart, is the second largest community in Dallam County. The town prepared its first master plan in mid-1981. Zoning and subdivision ordinances to implement the master plan have not been prepared. In Hartley County, the City of Channing could be expected to receive urban growth pressures as a result of M-X activities. The city does not at the present time have a master plan or any implementing ordinances.

Agriculture

There are no croplands located in the proposed OB suitability zone about eight mi southwest of Dalhart, Texas. All of the land in the zone is used for livestock grazing.

Table 3.4.7.3.10-1. Existing land use - Dallam and Hartley counties.

Land Use Category	Dallam County		Hartley County		Bi-County Total	
	Acres	Percent	Acres	Percent	Acres	Percent
Federal Land	77,582	8.1	--	--	71,582	4.1
Urban Land ¹	7,900	0.8	24,678	2.6	32,578	1.7
Water Areas	2,585	0.3	2,200	0.2	4,785	0.3
Rangeland	547,043	7.2	670,565	70.4	1,217,608	63.8
Dryland Crops	227,630	23.8	177,028	18.6	404,658	21.2
Irrigated Crops	85,260	8.9	72,972	7.7	158,232	8.3
Other Uses	8,160	0.9	4,749	0.5	12,909	0.7
Totals	956,160	100.0	952,192	100.0	1,908,352	100.0

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¹Includes cities, villages, highways, railroads, and airports.

Source: Panhandle Regional Commission, 1978, "Regional Land Resources Management Plan."



Although there are no croplands in the proposed OB suitability zone, the portion of the zone nearest Dalhart is across the highway from a large feeder lot operation.

Table 2.4.7.3.10-2. Existing land use--
Dalhart, Texas.

Land Use	Acres	Percent
Single family	274.5	18
Multi-family	8.8	1
Commercial	59.2	4
Industrial/Railroad	129.2	9
Public	55.5	4
Streets	464.7	32
Developed land subtotal	992.0	67
Vacant†	480.2	33
Total	1,472.1	100

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Source: Homer A. Hunter Associates, 1965,
"Comprehensive Plan, Dalhart,
Texas."

Recreation

Parklands

There are two National Grasslands, Rita Blanca and Kiowa; one New Mexico State Park, Clayton Lake; and Lake Meredith National Recreation Area within 50 mi of the proposed OB site (Table 3.4.7.3.10-3). Palo Duro State Park, Ute Lake State Park, and Capulin Mountain National Monument are parklands a bit further away from the Dalhart site. However, they are no doubt attractive to residents of Dalhart because of the rather limited parklands in the area.

Snow-Related Recreational Facilities

There are no snow-related recreational opportunities in the near vicinity of the proposed Dalhart OB site. The nearest facilities are in the Carson, Lincoln, and Santa Fe National Forests, over 200 mi to the west and south.

Water-Related Recreational Facilities

Outdoor recreation in this region is predominantly centered around water resources. Lake Meredith accommodates nearly one-half of the yearly visitors to the combined federally owned recreation facilities in Texas (Texas Parks and Wildlife Dept., 1975). Clayton Lake and Lake Meredith are the most developed recreational sites. Lake Rita Blanca County Park, south of the outskirts of Dalhart, also has facilities for camping, boating, and fishing.

ORV and Other Forms of Dispersed Recreation

Due to the large private land holdings in this area, opportunities for ORV recreation as well as dispersed forms of recreation, hiking, rockhounding, etc., are not abundant. In the entire area of 11 counties including Dallam and Hartley, there is only one hiking trail and one motorized trail (Texas Parks and Wildlife Dept., 1975).

Recreation Within the Suitability Zone

There are no developed recreation sites within the suitability zone of the proposed OB. Lake Rita Blanca County Park is located just to the east of the suitability zone. Because the Air Force has made it a policy to exclude selected recreation lands from M-X siting (see Section 2.1.2.1 of Chapter 2) no direct impacts are expected to this site (Figure 3.4.7.3.10-1).

Mining

There are no mining activities in the vicinity.

Native Americans (3.4.7.3.11)

Cultural Resources (3.4.7.3.11.1)

Historic aboriginal habitation sites associated with Apache peoples have been documented for the North and South Canadian rivers. Few Apache or Comanche

Table 3.4.7.3.10-3. Developed recreation sites in the vicinity of Dalhart.

Site Name	Activities	Acres	+Miles From Dalhart
Clayton Lake State Park	Camping	417	60
	Fishing	170 ¹	
	Boating		
Kiowa National Grasslands	Picnicking		45
Rita Blanca National Grasslands (Thompson Grove Recreation Area)	Picnicking	8	30-40
Lake Meredith National Recreation Area	Camping	22,671	70-80
	Boating	16,504 ¹	
	Fishing		
	Swimming		
	Picnicking		
Lake Rita Blanca		560 ¹	5

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¹Surface Water Acres

Source: New Mexico State Planning Office, 1976; Texas Parks and Wildlife Department, 1975.

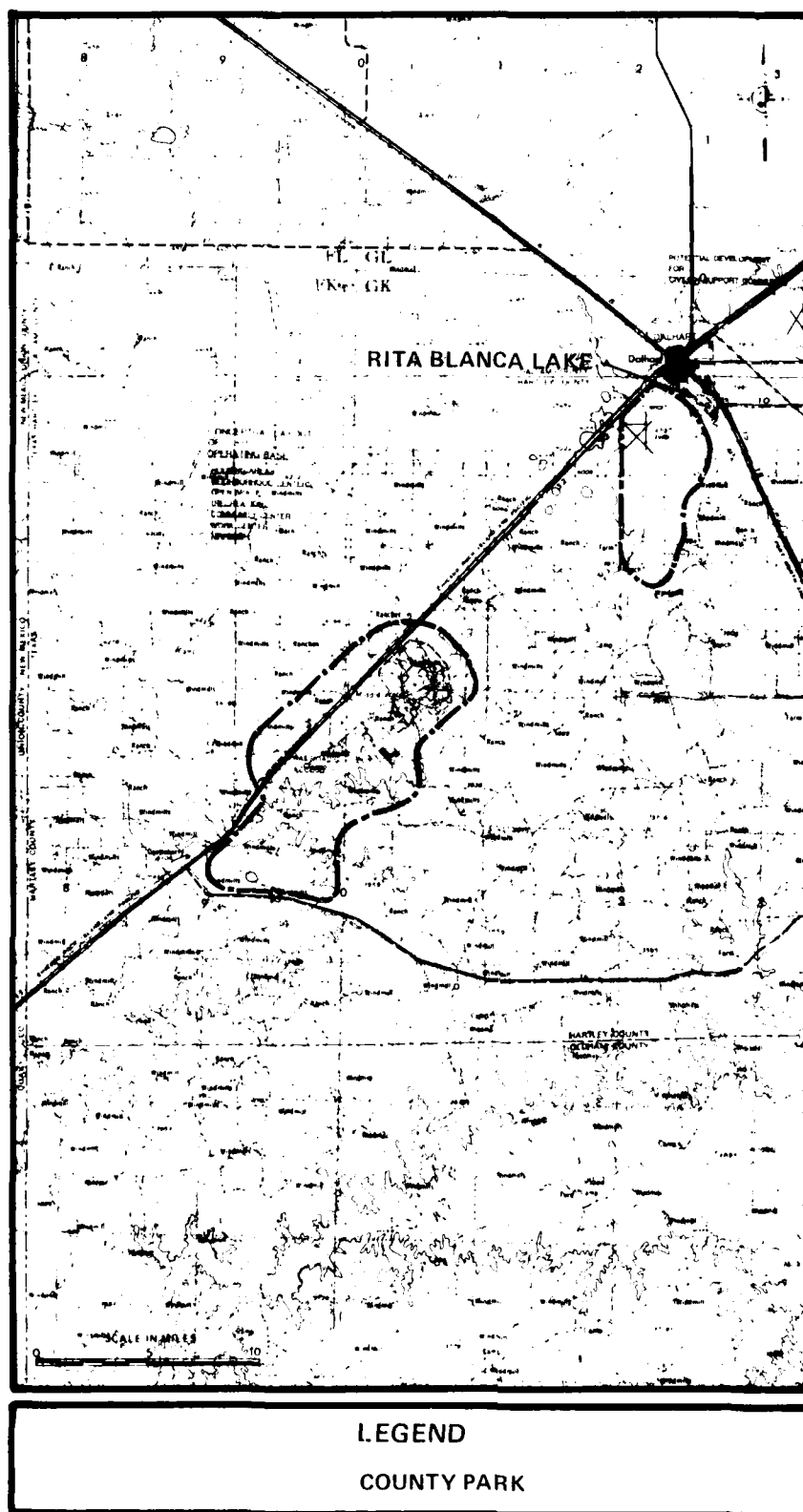


Figure 3.4.7.3.10-1. Recreation sites in the vicinity of the Dalhart OB suitability zone. 4719-A

material cultural remains have been inventoried for the Llano Estacado area of Western Texas. There are no Native American communities or Indian reservations in the vicinity.

Native Americans Land/Water Resources (3.4.7.3.11.2)

There are no known Native American land and water resources in the vicinity of the proposed Dalhart OB site.

Socioeconomic Characteristics (3.4.7.3.11.3)

There are no reservation lands or Native American communities in the vicinity of the proposed OB site.

Archaeological and Historic Resources (3.4.7.3.12)

The Dalhart vicinity zone includes the Punta de Agua stream valley. This valley probably contains numerous sites, especially those dating to the latter Neo-Indian period. This zone passes through areas of sand hills, and these sands store groundwater that can be easily tapped (Speers 1980:15). In general, sites may be expected both within the valley, and on overlooking bluffs.

Paleontology

The Dalhart OB is 80 mi west of the important vertebrate fauna localities in Hemphill County. The Hemphillian fauna is found in the upper 150 ft of the Ogallala Formation and could be found in the Dalhart area. Pleistocene deposits on top of the Ogallala could also contain fossils.



The Llano Estacado is a remarkably flat and uneroded remnant of a sedimentary Pliocene plateau extending over 20,000 square miles of Texas and New Mexico. This is the Dalhart OB site.

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